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COMPUTERWORLD

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How depressing! Federal systems integration pacts haunted by depression-era law restricting contracts above $100,000. Page 77.

No quick fix in OS/2 net schism

BY PATRICIA KEEFE
CW STAFF

Users peering hard at the LANscape for answers to their OS/2 connectivity questions will find little of substance reflecting back at them. IBM and Microsoft Corp.'s promise last November to provide mirror-image OS/2 servers will not become a reality until year's end at the earliest, according to Microsoft and sources close to IBM.

A critical issue for developers and users with multivendor networks, identical OS/2 file servers may not even appear until the first half of 1991, said Mike Murray, general manager of Microsoft's Networking Business Unit, and sources close to IBM.

Stuck on Novell

In the meantime, users such as Alex Kalpaxis, vice-president of micro systems and networks at Bankers Trust Co. in New York, are sticking with Novell, Inc.'s Netware. "I do feel that Microsoft and IBM should get their act together and introduce one product, because no one is going to buy the stuff otherwise," he said.

Despite Microsoft's apparent eagerness to make a name for itself in the local-area network market, it is proceeding cautiously with a two-pronged

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Million-dollar club open to CIOs

Compensation skyrockets as information execs shed mechanics' image

BY AMIEL KORNEL
CW STAFF

Corporate America has finally begun bestowing its richest honors on senior IS management. A growing elite of chief information officers currently collect the kind of paychecks once reserved for the chieftains of marketing and finance.

The person leading the way down the road to riches, by many accounts, is DuWayne Peterson, CIO at Merrill Lynch & Co. Peterson's total cash compensation, according to company documents, has skyrocketed during the last three years, surging from $566,807 in 1986 to $1 million in fiscal 1988, making him perhaps the highest paid CIO in the land.

Rivaling Peterson for top dollar, according to estimates by executive recruiters and compensation specialists, are such fellow Wall Street IS chiefs as Rick Adam at Goldman, Sachs & Co., Bob Gartland at Morgan Stanley Group, Inc., Joseph Castellano at Drexel Burnham Lambert, Inc., Eugene Bedell at CS First Boston, Inc. and Francis Dramis at Salomon Brothers, Inc., all of whom reportedly earn annual minimum compensation of at least $700,000. This would put them at more than six times the industry average.

Corporate financial statements as well as interviews with CIOs, recruiters and others who track hiring trends indicate that senior IS executives, who were once considered little more than the mechanics of the information age, are now viewed as its architects.

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HP casts minis in mainframe image

BY MARYFRAN JOHNSON
CW STAFF

NEW YORK — Jauntily projecting a new come-out-swinging attitude, Hewlett-Packard Co. officials last week introduced a beefy line of systems and servers.

The Palo Alto, Calif.-based company at least doubled the performance of much of its processor product line, claiming the broadest span of reduced instruction set computing machines on the market.

With the products, HP hopes to vault itself into the on-line transaction processing ring along with IBM and Digital Equipment Corp. It also aims to secure a place for its midrange systems as client/server engines connecting personal computers to the corporate database.

"We're not going into the mainframe business, but we are going to provide bigger OLTP machines and bigger servers," said John A. Young, the firm's

Continued on page 4

An upward push

HP's high-end 3000 model joins the DEC VAX 9000 in a bid to push minicomputers into the mainframe arena

	HP 3000 Series 980/200	DEC VAX 9000 Model 210
Performance	100+ trans./sec.[1]	44-70 trans./sec.[2]
Memory	256M bytes	256M bytes
Maximum disk storage	85.76G bytes	1T byte
Price	$1.09M	$1.24M
Availability	December	Spring

[1] TPC-A proposed benchmark [2] Debit/Credit benchmark

SOURCE: HEWLETT-PACKARD CO., DIGITAL EQUIPMENT CORP.
CW CHART: DOREEN DAHLE

How promise turned bitter for reluctant CASE superstar

BY NELL MARGOLIS
CW STAFF

Among the many start-ups spawned by the computer-aided software engineering boom of the mid-1980s, Optima Development, Inc. looked like a strong contender.

Co-founded by Ken Orr, a CASE methodology pioneer, funded with venture capital and headed by a dynamic young executive with roots in software marketing, the Schaumburg, Ill.-based company appeared poised for flight.

In reality, however, it may have been headed for a crash even before takeoff. Accounts that emerged in the wake of Optima's November 1989 insolvency show a company generally cursed with the ability to be in the right place at the wrong time and by the incompatibility of its founder and its hired-gun chief executive, Patricia Palmer.

"It was the classic 'founder vs. new leader' problem," said William Bryant, former Optima marketing vice-president and the estranged husband of Palmer. "Somebody should have left. It wouldn't have mattered which one."

In 1987, Orr, a respected software engineering methodologist and consultant, made a fairly aggressive — although not necessarily happy — move "from educator to product vendor," recalled Vaughan

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Jury duty

The Internet worm trial *began with the admission that Robert Morris Jr. wrote the program, an experiment gone awry. Page 6.*

NEWSPAPER

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101 An especially infectious virus shuts down Macintoshes in both Europe and the U.S.

Quotable

"Venture capital is a lot like steroids. You get pumped up artificially; then you get overly aggressive; then you get paranoid."

KEN ORR
OPTIMA

On the issues that led to the collapse of his company. See story page 1.

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UPDATE

Hold that career. Nearly 80% of working men and women said they would gladly sacrifice career advancement to spend more time with their families. This from a recent survey by Robert Half, personnel recruiters, which found that employees would reduce work hours an average of 13% in return for more quality time at home. Only one-third of those polled would accept a promotion that required less family time, and a clear majority said that employees who choose more flexible hours and slower career advancement . . . (cont. next week; had to go home to feed the kids).

Voice recognition has a long way to go. Page 17.

CINDY CHARLES

Del Monte's Sidney Daniel sees effective information use as key to quality control. Page 63.

EXECUTIVE BRIEFING

■ **Members of the information systems management elite** earn $200,000 to $1 million annually, according to an exclusive *Computerworld* report on the highest paid IS executives. Wall Street leads the way, with Merrill Lynch's DuWayne Peterson pulling in seven figures and other brokerage industry executives not far behind. Compensation packages at these firms have elevated IS executives into the top ranks among chief financial and operating executives. Deferred compensation in the form of stock options and other vehicles is increasingly part of offers designed to attract top IS talent. **Stories pages 1 and 100.**

■ **Eastman Kodak announced another pioneering outsourcing deal,** handing DEC the keys to most of its voice and data network management for the next five to 10 years. IBM will manage Kodak's SNA network, bringing the two vendors together in an unprecedented relationship. Separately, Dial Corp. inked an "interim outsourcing" pact with Andersen Consulting while it transfers its applications from an IBM mainframe to DEC minis. **Stories on page 8.**

■ **The trial of alleged Internet virus monger** Robert Morris Jr. opened in Syracuse, N.Y., with Morris's attorney admitting that he unleashed the virus but claiming it was "not designed to cause permanent damage." Morris is expected to take the stand this week or next. **Page 6.**

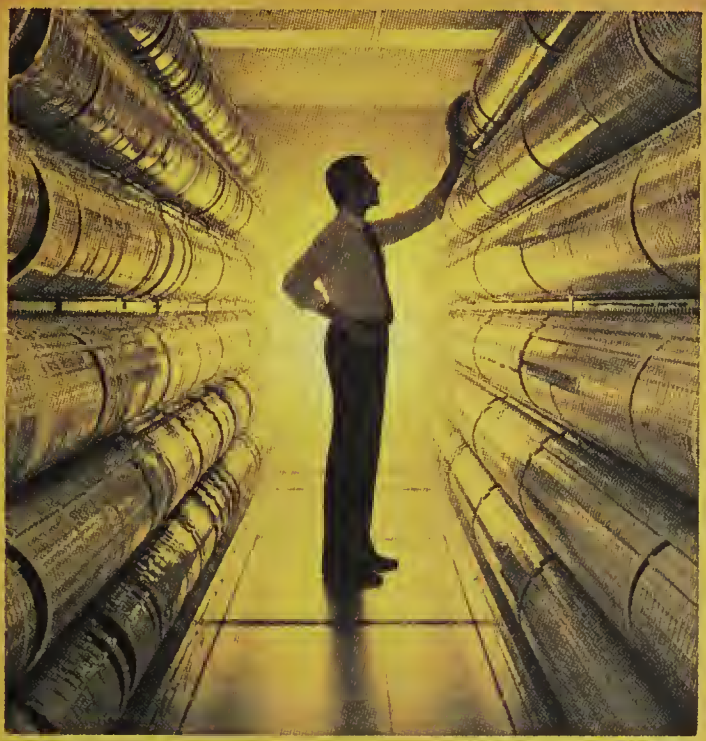
■ **From corn field to checkout counter,** information technology is playing a huge role in the food industry. Farmers, processors, distributors and retailers are all becoming much more sophisticated in technology use as computers, satellites and point-of-sale data-capture techniques redraw the lines of competition. **Page 63.**

■ **Apple Macintosh users should be on the lookout** for a virus that can freeze files and crash applications. Although relatively easy to remove by rebooting a system, the virus, discovered in both the U.S. and Europe, spreads easily through infected floppy disks. **Page 101.** A technical glitch rather than a virus can cause IBM PS/2 Model 70 users storing Microsoft Windows/386 files to a floppy disk to lose some or all of the files. While IBM works on a software patch to fix the problem, it advises users to store on their hard disk, then copy to the floppy. **Page 7.**

■ **A challenging job** is the top motivator of programmers and analysts, according to a University of Colorado survey. The nationwide survey found that pay and benefits were more important than 10 years ago. Concern for company policies and working conditions remained unchanged. **Page 73.**

■ **CASE pioneer Ken Orr's company** foundered on a sea of internal strife, squandered venture capital and bad timing. Optima Development entered the CASE business just as the market paused to absorb the initial buying flurry — and to recover from the 1987 stock market crash. **Page 1.**

■ **On-site this week:** Pacific Bell had to go against its "buy don't build" corporate philosophy for a graphical user interface used by its 8,000 customer support representatives. A four-year development effort has produced Starlink, a multitasking, menu-driven screen with both DEC and IBM terminal emulation that accesses the regional phone company's far-flung corporate databases. **Page 37.** British Telecom opened its business through privatization and is now opening its systems. The firm has chosen OSI as its backbone network in an attempt to integrate 57 CPUs from several proprietary-architecture vendors. **Page 25.**



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Early 3390 drive users upbeat

BY ROSEMARY HAMILTON
CW STAFF

Two big IBM accounts recently put the 3390 disk drive through its paces and declared it a winner.

Initial reaction from US West Communications, the telephone utility for the Western states, and Shearson Lehman Hutton, Inc. — which have already loaded a combined 795G bytes of data on the new drives — must be sending a sigh of relief through IBM. The company has a lot riding on the initial performance of this product, which could bring in billions of dollars.

However, those potential billions were put at risk last year when IBM postponed the initial scheduled 3390 announcement because of unspecified technical problems. Customer reaction spanned from nervousness over the product's soundness to outright fury that IBM would not be delivering on schedule.

IBM's 3390 *drive saves floor space*

But last week it appeared that IBM was redeeming itself, at least with two key accounts. US West and Shearson said they were convinced that IBM had fixed the 3390 technical problem, and they reported no major glitches since installing the devices in late summer.

"We have implicit faith in IBM to come through for us," said Henry Hamilton, senior vice-president of EDP services at Shearson. "We didn't feel the problems were anywhere near what had been talked about. During the entire early support program, we had four problem incidents."

Tom Leitch, a systems analyst at US West, said it was not a matter of faith but an opinion that IBM had already messed up with its 3380 disk drives once, so it could not "afford to screw up again." According to Leitch, IBM got it right this time.

"It's quite an improvement, really," Leitch said. "We found that all the glossy claims IBM made were true."

US West, which had been using a variety of IBM 3380 disk drive models, participated in IBM's 3390 test program and took delivery of its first direct-access storage device (DASD) string in late August. Since then, the company has added six more strings of DASD, plus one additional 3390 A unit. All together, the units handle 435G bytes of data. US West switched them to full production mode earlier this month and now reports that all is quiet on the disk drive front.

Leitch said the most annoying problem during the test phase was modifying software so it was aware of the new 3390 features, such as the faster data transfer rate. The process took close to six weeks because most of the third-party suppliers were not ready with their modifications. Interestingly, IBM was not ready either, Leitch said.

Hamilton said the problems he encountered were hardware ones, but none of them were serious. Currently, he has six strings installed, totaling 360G bytes, and he said he plans to add another 16 strings this year.

"They were isolated incidents, like a motor being out of phase," Hamilton said.

HP casts

FROM PAGE 1

president and chief executive officer. "You'll see big mainframe applications being pulled off those mainframes and being placed onto servers. It's so much more cost-effective."

John Robinson agreed. The director of corporate information systems at Cox Enterprises, Inc. is considering a switch from an IBM-based mainframe newspaper circulation system to another system running on HP 3000s at the *Atlanta Constitution* and other Cox newspapers.

"These new announcements really remove that concern that the 3000 would not be powerful enough to run those applications," he said.

The new systems tripled — and in some cases, quadrupled — the power of HP's previous high-end models. However, the most attractive feature may be their ability to upgrade with a board swap rather than a new box, several users agreed.

Upgrades will cost from $30,000 to $295,000. A move from a Unix-based HP 9000 Model 855S to the next level will cost $208,000, for example.

"It's a pretty tremendous marketing advantage to do field upgrades that are installed for you," said David Rimer, manager of computer operations at Choicecare in Cincinnati.

"Having the software object-code compatible is pretty significant, too," Rimer added, "except that all the software isn't in native mode capability yet, so it doesn't take advantage of all the RISC-type architecture."

Although many upgrades will not be available for six months to a year, the company decided to introduce the entire line at once to let customers get a glimpse of what awaits them, said HP spokeswoman Jill Kramer.

In many ways, the massive product announcement was HP's payoff for seven years of wading through RISC research and development, analysts said.

"HP is in a considerably stronger position in the midrange systems market against DEC now," said George Weiss, an analyst at Gartner Group, Inc. in Stamford, Conn.

On the storage front, HP introduced a 700M-byte disk drive, half the size of a shoe box.

West Coast Bureau Chief Jean Bozman contributed to this story.

Fighting words

HP pits the high-end 9000 model against the VAX 6000, but its challenger won't be available for almost a year

	HP 9000 Model 850S/200	DEC VAX 6000 Model 640
Performance	95 MIPS	36 VUPs*
Memory	128M bytes	192M bytes
Maximum disk storage	85.7G bytes	38.8G bytes
Maximum users	304	656
Price	$689,000	$752,000
Availability	December	Now

*VAX units of performance, based on comparison with the VAX-11/785, which is roughly equivalent to 1 MIPS

SOURCE: HEWLETT-PACKARD CO., DIGITAL EQUIPMENT CORP.

CW CHART: DOREEN DAHLE

Sharing the load

Hewlett-Packard Co. is betting that cooperative processing will dominate the 1990s, as desktop personal computers and workstations start processing a greater share of a corporation's computing work load.

During last week's introductions, HP Chief Executive Officer John A. Young said minicomputers will handle on-line transaction processing functions and house database management systems from which desktop machines can extract corporate data.

"This all strikes me as pretty interesting," said Ray Geitka, director of computing services for the University of Michigan, where an HP 3000 handles financial applications and student data. "We just purchased a Model 935 in an upgrade less than a year ago, but we're examining some database systems and recognizing how they gobble up quite a bit of resources."

MARYFRAN JOHNSON

Cover the gamut

Hewlett-Packard Co.'s 24 new systems and servers cover the spectrum from low-end and midrange machines up to the edge of mainframe-class power.

While most of the products will not be available until later this year, users willing to wait will find that each line expands through field-installable board upgrades — no box swaps — with software that is object-code compatible.

The following are new from HP last week:

- For the HP 3000 line, eight new multiuser systems intended for the commercial on-line transaction processing market were announced. The new Series 900 high-end models, which run HP's MPE/XL operating system, triple the current top performance of this line.
- For HP 9000 systems, the company added five new multiuser Unix machines based on HP's Precision Architecture, including a symmetrical multiprocessing system that quadruples the performance of the previous high-end 9000 Model 960. The 9000 line includes Series 800 multiuser machines and Series 600 servers.

MARYFRAN JOHNSON

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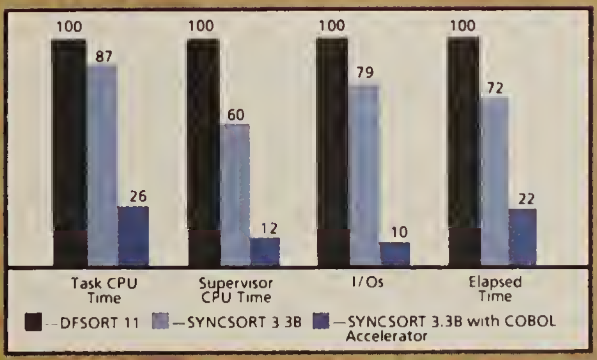

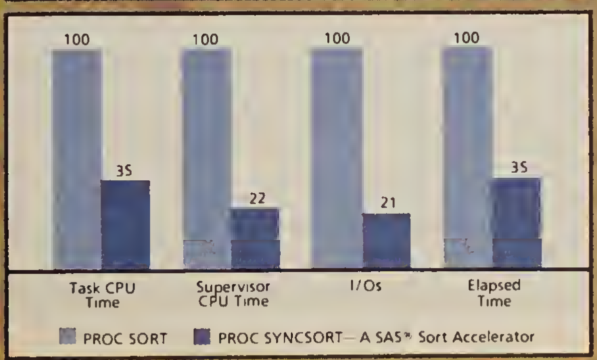

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Morris case centers on intent

BY MICHAEL ALEXANDER
CW STAFF

MORRIS PHOTOS: STEPHEN D. CANNERELLI/SYRACUSE NEWSPAPERS

Robert T. Morris Jr. *(second from right) and family enter trial*

SYRACUSE, N.Y. — The trial of Robert T. Morris Jr., accused of disabling some 6,200 computers with a worm, began last week with his attorney's admission that Morris hatched the program and unleashed it into the Internet computer network on Nov. 2, 1988.

In opening remarks, defense attorney Thomas Guidoboni said Morris created the worm as part of a computer security experiment but that a "critical mistake" caused the program to replicate uncontrollably.

"The worm caused no permanent damage and was not designed to cause permanent damage," Guidoboni told the 13 jurors in U.S. District Court here. "It was designed to spread slowly and quietly and only affect a few computers."

However, Guidoboni was unsuccessful in seeking to prevent witnesses from testifying on the costs of repairing damage caused by the program.

Federal prosecutors, in their opening remarks, charged that Morris concocted and let loose the worm as part of a "full-scale assault on computers throughout the U.S." while he was attending Cornell University in Ithaca, N.Y., as a computer science graduate student.

The charges

Morris, 24 years old, is accused of gaining unauthorized access as well as preventing authorized access to "federal interest" computers and causing losses in excess of $1,000 in violation of the Computer Fraud and Abuse Act of 1986. He is the first author of a computer worm or virus to be brought to trial under the statute.

If convicted, Morris could be imprisoned for up to five years, fined up to $250,000 and ordered to make restitution to those victimized by the worm program.

Even before the trial started last Monday with jury selection and opening arguments, prosecutors filed a motion to hamper Morris' expected defense — that he did not consciously intend for the worm "to spread as explosively" or to "cause damage or loss that it caused."

"The evidence of lack of intent to cause loss or lack of intent to prevent the authorized use of the victim computers, however, is simply not relevant to any issue in this case," according to the motion.

The worm clogged the memories on some 6,200 Digital Equipment Corp. and Sun Microsystems, Inc. computers on Internet until they could no longer function.

Morris devoted "a lot of time, energy and research planning this assault," said Mark Rasch, a trial attorney at the U.S. Justice Department. The worm was designed to penetrate as many computers as possible and was programmed "to hide itself to frustrate victims of the attack," Rasch said.

More than one worm

The government's first witness, Dean Krafft, a researcher in Cornell's computer science department, testified that he had uncovered at least three versions of the worm program in hidden directories in Morris' computer account at Cornell. Krafft said that the worm infected about 70 computers at Cornell.

On cross-examination by Guidoboni, Krafft conceded that the program contained code that appeared to control the rate at which the worm was designed to replicate itself.

Cornell suspended Morris following the incident, but Krafft said Morris would be eligible to reapply.

Despite strenuous objections from Guidoboni, Mark Brown, director of research, development and systems at the University of Southern California, was allowed by Judge Howard Munson to testify that he had calculated the cost of the time spent combating the worm — 170 hours — at $12,600.

At the University of California's Berkeley campus, "Several hundreds of computers were overwhelmed by repeated attacks by the worm program," testified Keith Bostic, a programmer/analyst in the computer systems group, who estimated the resulting cost at $3,500.

Prosecutors stressed repeatedly that the computers linked on Internet are frequently used for critical research work and added that the worm program hindered researchers for several hours until it finally could be destroyed.

Guidoboni, in turn, downplayed the value of the computer network to researchers and told jurors that the network was also widely used for such things as the exchange of personal messages, including "love letters," and for playing games.

Guidoboni said his client would take the stand to defend himself during the trial, which is expected to conclude either this week or the next.

Jawbreaking issues

The trial of Robert T. Morris Jr. is likely to hinge on whether the prosecution is able to dish out arcane computer terminology in a palatable form to jurors. However, computer literacy was not considered a desirable attribute by either the prosecution or defense during jury selection.

Of the 23 prospective jurors called last Monday in Syracuse for the celebrated computer fraud case, three who owned personal computers were dismissed. However, two jurors were accepted even though they said they used computers in their work. The jury is made up of 10 women and three men.

During the trial's first week, federal prosecutors repeatedly prodded witnesses, all of whom are computer science experts, to answer their queries in basic, nontechnical terms. The witnesses were interrupted often and asked to explain a wide variety of terms including "bug," "crashing" and "running program."

The defense was less diligent in asking witnesses to clarify certain terminology, perhaps in a maneuver to befuddle jurors and cause them to doubt the strength of the prosecution's case. In cross-examination of Dean Krafft, a Cornell University computer scientist, for example, defense attorney Thomas Guidoboni closely questioned Krafft on the function of the "Anonymous FTP" utility without asking him to explain it first. In follow-up questioning, however, prosecutor Mark Rasch pressed Krafft to tell jurors that the term described a utility that enables a user to find out who else is logged on to the computer system.

At one point, even Guidoboni seemed overwhelmed during the constant interchange of computer jargon. "I'm sorry, I'm out of my depth," he told jurors with a rueful smile.

The court reporter also struggled to keep up with the spate of technical terms. He interrupted the attorneys and witnesses several times to ask them to spell "Unix," "Finger D" and other terms. The courtroom burst into laughter at one point when the court reporter asked Mark Brown, a research, development and systems director at University of Southern California, to spell out "info-vacc@beast.ddm.mil," Brown's E-mail address on Internet.

MICHAEL ALEXANDER

OS/2

FROM PAGE 1

strategy designed to boost sales by establishing a core standard for LAN Manager-based servers and by broadening distribution of these products.

That caution means not only that users face another year of delay before they can build networks around a standard LAN Manager, but it also creates a dangerous situation for IBM and Microsoft, since the migration to OS/2 is expected to begin at the server.

The slow pace also will have a boomerang effect on sales of SQL Server, which requires LAN Manager, and the first stage of IBM's Officevision, which is based on an OS/2 LAN. "There's been an incredible lack of SQL Server sales because of that very reason," said Doug Gold, an analyst at International Data Corp. in Framingham, Mass. IBM needs OS/2 to succeed with its Officevision strategy, which is supposed to provide complete connectivity for the PC LAN environment, Gold added.

The current delivery schedule means that efforts to converge the two OS/2 servers — Microsoft's LAN Manager and IBM's OS/2 LAN Server — will not coincide with the upcoming release of LAN Manager 2.0, even though Microsoft's LAN Manager is at the core of IBM's server.

In fact, Bernd Harzog, product manager for the joint Digital Communications Associates, Inc./Microsoft Select Communications Server, an alternative to IBM's Communications Manager, claimed that IBM's forthcoming upgrade to its server, Version 1.2, will lack a number of LAN Manager 2.0 attributes. Those are said to include some level of peer services, disk mirroring and file replication.

The reason, according to Murray and Frank Dzubeck, an IBM consultant and president of Communications Network Architects, Inc., is that both vendors already had their soon-to-be-released server upgrades well under development when the announcement was made.

Given that reality, Dzubeck said IBM's immediate goal is to get OS/2 LAN Server in sync with OS/2 Extended Edition 1.2. Both products are expected to ship in March, at which time they will be in sync with Officevision Release 2.0, Version 1, he said.

According to Dzubeck, there is about a 15% difference in the code between the two vendor's servers, but a bigger gulf exists at the application programming interface level.

IBM's server features management, administrative and support facilities that LAN Manager lacks, Dzubeck said.

Only when OS/2 LAN Server 2.0 is available with a full 32-bit complementary operating system and security issues are resolved, will Bankers Trust consider looking at LAN Manager. "Until that happens, I can understand why companies are cautious about jumping on the LAN Manager platform," Kalpaxis said.

Separately, Murray would not confirm or deny assertions from 3Com Corp. executives that the two are working together on a shrink-wrapped version of LAN Manager, with the goal of broadening distribution of the product. 3Com said it will go to OEMs in the second half of 1990.

IBM, HP lead team touting distributed computing plan

BY AMY CORTESE
CW STAFF

A group of vendors led by IBM and Hewlett-Packard Co. last week disclosed a proposed architecture designed to enable distributed computing within networked multivendor environments.

The vendors disclosed details of a proposal they made last fall to the Open Software Foundation (OSF), offering a suite of technologies labeled Decorum that represent a uniform architecture for distributed computing and for tools needed to create software programs that would operate in such an environment.

A distributed computing standard would provide a uniform set of software and networking services for developers and users, relieving them of the underlying complexities with which they battle today. "You have to design your own way to accomplish distributed computing," said Larry Sikon, chief technical officer at DHL Systems, Inc.

"What we have now are many partial solutions but no integrated solution that works across multiple environments," said Jonathan Gossels, OSF's business-area manager for interoperability. OSF is hoping that the same request for technology process that resulted in the Motif graphical user interface will result in a standard set of services for creating and using applications in a distributed environment.

The OSF request calls for technology that will allow interoperability among not only Unix platforms but proprietary ones as well. Both HP and IBM are investigating incorporating the Decorum technology into their proprietary lines. George Siegle, director of development for IBM's Personal Systems line, acknowledged it "would be logical for IBM to push some of the pieces back to OS/2."

The Decorum offering is based in large part on Apollo's Network Computing System but also includes the Transparent Computing Facility, developed by Locus Computing Corp. for IBM, and the Andrew File System, from Transarc, a spin-off from Carnegie-Mellon University in which IBM has invested.

Digital Equipment Corp. and Microsoft Corp. contributed technology, but neither endorsed the entire proposal. DEC said it believed only the core components of a distributed computing architecture should be standardized.

Analysts said Decorum is aimed squarely at Sun Microsystems, Inc.'s Open Network Computing (ONC)/Network File System, which Sun has also submitted elements of to OSF.

Arguments in favor of Sun's proposal are its large installed base of close to 300 licensees and the inclusion of ONC in AT&T's Unix System V, Release 4.

Some Model 70s can't do Windows

BY PATRICIA KEEFE
CW STAFF

Users of certain models of IBM's Personal System/2 Model 70 running Microsoft Corp.'s Windows/386 run the risk of losing some or all of their files when storing data to a floppy disk. However, a software patch is just a few weeks away, IBM said.

While they wait for the fix, IBM is telling affected customers to take the following steps to circumvent the problem:

- Save files to the *hard* disk.
- Exit the program and Windows/386.
- Use the DOS copy command to copy the file or files to a floppy disk.

IBM took Microsoft by surprise when it called the trade press to alert them to the problem and its pending resolution.

An IBM spokeswoman said that the glitch stems from a set of program instructions written around the PS/2's BIOS level. Specifically, Rich Able, Microsoft's Windows product manager, said the problem relates to changes in the read-only memory (ROM) BIOS related to the floppy disk controller on specific Model 70s.

Microsoft has tested the application on the PS/2 line, including earlier versions of the Model 70. But Windows/386 was last revised in March, and the affected workstations — the Models E61, the 121 and 061 — first shipped in September. Able said Windows/386 is closely tied to hardware.

The IBM spokeswoman said that customers brought the problem to the attention of IBM and Microsoft. Able said his customer support team has not received many calls about the problem, "so this must [be] a fairly obscure" occurrence.

IBM has attacked the problem from two directions. First, it has already implemented a hardware ROM BIOS fix into PS/2s coming off the production line.

Secondly, a software patch, developed by IBM in consultation with Microsoft, is currently being tested and will be available in a few weeks, the vendors said.

The disk will be available from both vendors and authorized dealers.

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NEWS SHORTS

Siemens buys Nixdorf

Attributing its own current corporate health largely to its recent reorganization and acquisitions, West German industrial giant Siemens AG last week went with yet another acquisition — a 51% initial stake in financially ailing systems vendor Nixdorf AG. Siemens' catch will cost the $36 billion technology company $596 million. Siemens expects the newly planned Siemens-Nixdorf Informationssysteme AG to net its parent some $7.15 billion in annual sales.

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EDI user groups merge

Two major user groups for corporations involved in electronic data interchange (EDI) — the EDI Council of the USA (EDICUSA) and the North American International EDI Users Group — have merged. The North American group will become a committee of EDICUSA, which is administered by TDCC: The Electronic Data Interchange Association in Alexandria, Va.

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Informix establishes link

Informix, Inc. bonded the two sides of its software house last week, allowing its Wingz spreadsheet to generate SQL queries to the Informix Online database management system by announcing a $25 Datalink module.

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Oil spill blamed on systems

Exxon Corp. officials last week pinned at least some of the blame for a 500,000-gallon oil spill on computer systems that failed to identify the problem even as the heating oil was pouring into waters off Staten Island, N.Y. However, Exxon declined to provide specifics on the types of systems involved.

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Hayes ISDN card goes commercial

After two years of providing its Integrated Services Digital Network personal computer card to only a limited number of trial sites, Hayes Microcomputer Products, Inc. last week announced a commercial version scheduled to ship by midyear. Based on Hayes' widely installed AT protocol and priced at $1,599, the ISDN PC Adapter is said to connect PCs to ISDN services based on either AT&T or Northern Telecom, Inc. central-office switches.

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Feds step into suit against NBI

The U.S. Department of Justice last week took over a lawsuit filed secretly in June against NBI, Inc., which allegedly overcharged the U.S. General Services Administration on data processing equipment contracts. The suit, which demands $6.6 million in damages, was filed under seal in June by former NBI employee Kenneth L. Marcus.

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Amadeus center opens

Amadeus Global Travel Distribution, Europe's leading computer reservation system, is slated to open its 13,000-sq. ft. computer room in Erding, West Germany, today. The investment in the Amadeus Operations Co. is worth about $100 million for the IBM and Unisys Corp. hardware and another $100 million for the pentagon-shaped building, the company said. It reportedly will be one of the largest data processing centers in the world. The new center will cause the phasing-out of current IS centers in Miami and Stuttgart, West Germany.

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IBM buys into developers

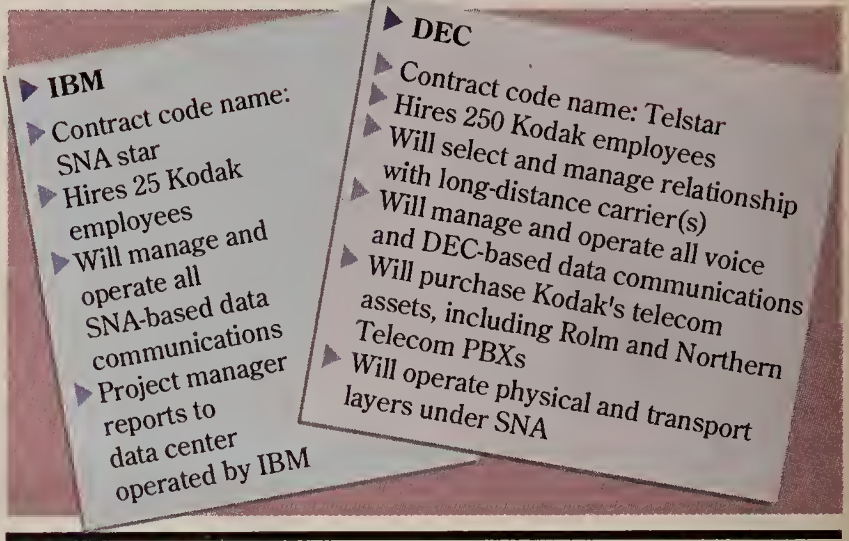
IBM went shopping for software in Santa Clara, Calif., last week and came home with minority equity stakes in two developers based there. The first, Rational Data Systems, Inc., is a maker of computer-aided software engineering tools for Ada application development. The second, Valisys Corp., is a producer of computer-integrated manufacturing software. IBM will join these firms in future product enhancements and will use the products to design and manufacture its own packages.

DEC, IBM play ball in Kodak deal

BY CLINTON WILDER
CW STAFF

Mixed messages

Kodak will split its communications needs between IBM and DEC



IBM
- Contract code name: SNA star
- Hires 25 Kodak employees
- Will manage and operate all SNA-based data communications
- Project manager reports to data center operated by IBM

DEC
- Contract code name: Telstar
- Hires 250 Kodak employees
- Will select and manage relationship with long-distance carrier(s)
- Will manage and operate all voice and DEC-based data communications
- Will purchase Kodak's telecom assets, including Rolm and Northern Telecom PBXs
- Will operate physical and transport layers under SNA

SOURCE: EASTMAN KODAK CO. CW CHART: DOREEN DAHLE

ROCHESTER, N.Y. — Eastman Kodak Co. turned heads last year when it signed up IBM to do what the vendor had never done — run a customer's data center. Last week, Kodak enlisted Digital Equipment Corp. for a similar unprecedented step — taking over the management of Kodak's worldwide voice and DEC-based data communications networks for the next five to 10 years.

DEC will also break new ground in competitor relationships by managing the physical and transport layers supporting Kodak's IBM Systems Network Architecture (SNA) data network. IBM will manage the SNA network software essentially as an adjunct to its ongoing data center management.

Kodak insists the DEC-IBM arrangement [CW, Nov. 6, 1989] does not raise potential conflicts. "They may be competitors out in the marketplace, but in the negotiating process they have both become collaborators to Kodak," said Henry Pfendt, director of information technology services at Kodak.

DEC will hire 250 Kodak telecommunications employees "ranging from wire-pullers to senior management," said Dick Pickman, DEC's program director for the Kodak project. IBM will hire 25 Kodak SNA specialists, adding to some 300 Kodak information systems employees hired last year under its data center consolidation and operation contract. Finalization of the telecommunications contracts and the transfer of employees is slated for March 1.

Outsourcing network management is becoming increasingly popular, with Merrill Lynch & Co.'s 1989 contract with MCI Communications Corp. also garnering a lot of attention. Kodak's arrangement, however, is unique for both the dual-vendor aspect and the hiring of Kodak employees by the vendors.

Using both DEC and IBM "could either be very bright or could be like two dogs chewing each other to death," said John Payne, staff telecommunications analyst at Charles Schwab & Co. in San Francisco. "Telecom is a substantial part of the IS budget, and if they can reduce that by outsourcing, there will be a lot of pressure on other telecom departments."

Kodak would not specify its projected savings in telecommunications, and said only that it will be "significant." The $17 billion company also hopes that the arrangements will hasten its direction to more open network architectures.

"We have two players who both profess to be moving in that direction," said Alan Chase, a Kodak group manager in computing and telecommunications services who may become a DEC employee.

DEC will be responsible for selecting the carriers for Kodak's telecommunications and managing the relationship with them. Kodak currently does business with AT&T, MCI, U.S. Sprint Communications Co. and Rochester Telephone Corp. DEC will also purchase most of Kodak's telecommunications infrastructure.

"We will be analogous to Kodak's phone company," Pickman said. "We will own the assets and provide the services to them."

Dialing out

PHOENIX — Consumers may be glad they use Dial, but the soap manufacturer wants to use an outsourcing vendor while it downsizes its computer operations.

Dial Corp. opted for outsourcing last week with a $10 million contract for Andersen Consulting to run its mainframe operations and telecommunications network for up to five years. The firm will bring information systems operations back in-house after recasting its IS into a network of Digital Equipment Corp. midrange computers. Dial chose to outsource mainframe operations to allow its IS staff to focus on the downsizing effort, said William L. Anthony, senior vice-president and controller.

Outsourcing fever prompts IBM service group revamp

BY ROSEMARY HAMILTON
CW STAFF

With dreams of outsourcing business dancing in its head, IBM last week restructured its National Service Divison (NSD) to go more fervently after this emerging market.

The restructuring involves little more than a name change, save for one important piece. In an unusual move, IBM is pulling the internal information systems operation for the U.S. marketing and services division into NSD. In other words, an internal IS staff is now working for one of IBM's key marketing teams.

"We believe the tools we have for our internal operations are some of the best in the world," said William Wilson, who will head System Services, a new component of NSD.

NSD will now consist of three groups. System Services will focus on outsourcing business and will include all of the so-called service extras, such as data center design, that NSD has provided. Software maintenance and hardware maintenance will each function as a separate group from System Services.

The internal IS chief for IBM's U.S. marketing and services division will now report to Wilson.

"It's a smart move," said Don Goodspeed, vice-president of service and maintenance strategies at Meta Group, Inc. in Westport, Conn. "If you want to do something like outsourcing and you don't control all the vehicles to deliver this, then you've got a problem."

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Oracle Oracle Corp.	71	75	75	70	70	70	72	68	71	77	80	61	61
DB 2 IBM Corp.	70	78	75	75	75	70	68	67	67	70	66	59	60
SQL/DS IBM Corp.	68	73	71	70	71	66	67	67	63	75	67	61	62
IMS/DB IBM Corp.	67	74	75	75	69	66	67	66	63	61	64	58	61
Adabas IBM Corp.	66	76	75	69	71	66	68	67	62	56	65	59	55
Focus Information Builders Inc.	66	73	70	70	62	66	68	66	64	55	72	60	57

GCN Product Preference Survey: DBMS for UNIX

Product/Company	Overall Weighted Rating	Reliability	Performance	Vendor Support	Security	Documentation	Development Environment	Ease of Administration	Multiple Operating Environments	Distributed Operations	SQL Interaction	Price	Graphics Support
Oracle Oracle Corp.	72	79	79	69	74	70	71	67	80	73	79	59	60
Informix Informix Software Inc.	69	79	77	66	67	66	72	69	72	68	68	64	52
Ingres Relational Technology Inc.	66	70	71	69	67	65	67	67	71	58	68	55	56
Unify Unify Corp.	62	67	68	57	65	60	85	82	63	62	65	61	50

GCN Product Preference Survey: DEC VAX/VMS DBMS

Product/Company	Overall Weighted Rating	Performance	Reliability	Vendor Support	Documentation	Security	Development Environment	Ease of Administration	Distributed Operations	Multiple Operating Environments	SQL Interaction	Price	Graphics
Oracle Oracle Corp.	70	74	76	69	68	70	73	66	71	78	76	56	60
VAX DBMS Digital Equipment Corp.	68	73	78	74	68	71	68	89	67	65	61	60	62
RDB/VMS Digital Equipment Corp.	67	71	77	77	69	69	82	66	65	57	62	64	54

GCN Product Preference Survey: LAN Data Managers

Product/Company	Overall Weighted Rating	Reliability	Compatibility With Existing Network	Speed	Compatibility With Single User Files	Standards Compatibility	Programming Features	Record Locking	Cost	Third-Party Support	Network Licensing Features	Vendor Advice
Professional Oracle Oracle Corp.	71	79	75	76	67	75	76	77	58	68	65	61
R:Base for DOS Microrim Inc.	70	75	75	68	72	68	72	69	72	64	73	60
dBase III Plus Ashton-Tate Corp.	68	73	73	67	72	73	71	64	64	67	64	57

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	Raleigh	Feb 1*f*#
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COMP.WORLD

Businessland slumps, cuts

'Efficiencies' cited in layoffs, but Compaq loss hurt margins

BY RICHARD PASTORE
CW STAFF

Compaq Computer Corp.'s split with Businessland, Inc. last year wounded the reseller more deeply than it expected, company President David Norman admitted last week.

Businessland announced it will lay off 5% to 7% of its 3,900 employees and may suffer a loss in the December quarter.

Norman said the primary reasons for the layoffs are redundancies arising from recent dealer acquisitions and efficiencies derived from the firm's new automated information system. However, Compaq's decision to pull its products from the reseller's stores early last year has badly bruised Businessland's bottom line.

"Clearly, the loss of Compaq had a greater impact on our revenue and operating margins than we originally anticipated," Norman said, adding that Compaq once represented 15% of Businessland's sales revenue.

Businessland counted on sales of Next, Inc. workstations and Netframe Systems, Inc. file servers to fill the void, but lengthy product delays punctured that balloon.

Because of operating system and applications delays in 1989, "there was no way that Next could make up in the short term the large revenue loss that Businessland experienced," Norman said.

He added that unit sales of Next machines last year totaled only "in the hundreds." His prediction of $100 million in 1990 Next sales "is still a good deal behind what I would have liked."

Businessland's Norman

Analysts said Businessland had little chance of filling Compaq's shoes with unproven technology like Netframe and Next. "You can't replace the No. 2 PC vendor with a bizarre new architecture that nobody's ever heard of," said Lee Levitt, an analyst at market research firm International Data Corp. in Framingham, Mass.

The layoffs, which will involve 200 to 275 U.S. employees, take effect today. The cuts will mainly target field personnel and will not affect support and value-added services, Norman claimed.

Acting Chief Financial Officer James Helsch said the final financial tallies will not be ready until Jan. 24, but there is "a possibility" that the $1 million to $2 million layoff charge will cause a net loss for the quarter.

Software case could boomerang

BY DAVID A. LUDLUM
CW STAFF

Last week's U.S. Commerce Department ruling that a software package from Singapore should be subject to import duties has worried some American software makers concerned that other countries may impose duties on U.S. exports.

In a preliminary finding, the Commerce Department's International Trade Administration (ITA) ruled that a Singapore company is selling a computer-aided software engineering (CASE) tool in the U.S. with the help of an unfair Singapore government subsidy.

The ruling has raised concern among U.S. software makers that other countries might impose import duties on their products.

That is one of the reasons that Adapso, the trade association, has taken no position in the case, said Doug Jerger, director of the association's software division. "We want to promote international trade, not inhibit it," Jerger said.

The ruling came in response to a petition filed in August by Visible Systems Corp., a CASE vendor in Waltham, Mass. It charged that the Singapore government unfairly subsidized a competing vendor's product, Pose, a CASE tool marketed in the U.S. by Woodcliff Lake, N.J.-based CSA, Inc., a subsidiary of CSAR Pte. Ltd. in Singapore.

Singapore's Information Technology Institute developed prototype versions of Pose. The ITA's ongoing investigation revolves around the terms under which the goverment agency awarded commercial rights for the product to CSAR.

The ITA determined that the royalties CSAR paid to the Singapore government should have been 15.25% higher to cover the government's development costs and that countervailing duties should be imposed on imports of Pose entering the U.S.

The ITA is expected to make a final ruling by March 26, which provides an opportunity for the parties to present more information. The ITA said Singapore failed to provide all the information it sought. That contention was disputed by Walter Spak, an attorney at Willkie, Farr and Gallagher in Washington, D.C., who represents CSAR and Singapore. Spak said the ITA failed to use all the information that Singapore did provide.

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CA locks up software security

BY ROBERT MORAN
CW STAFF

NEW YORK — Computer Associates International, Inc. last week broadened its security software coverage, introducing products for IBM's DB2 as well as IBM-compatible personal computers.

The company introduced CA-Cortana, stand-alone PC-based security software that the company said will give organizations security features such as user authentication and resource access control, which are normally found on the mainframe.

The mainframe-based software for IBM's DB2 — CA-ACF2/DB2 and CA-Top Secret/DB2 — will provide the same features, functions and methods that organizations are conditioned to using with CA security software in other IBM operating systems and database environments.

One-stop security

Kim Bell, CA marketing manager for security, control and audit products, claimed that large organizations with huge PC investments will be able — and will want — to purchase mainframe and PC security software from a single source.

CA-Cortana is priced at $395 per license, with volume discounts available, and the software runs on the IBM Personal Computer/XT, AT, Personal System/2 or compatibles.

The software, which was acquired in August 1989 from United Software Security, Inc. based in Vienna, Va., has been upgraded with mainframe-style features.

The package went into beta testing in November and will be available in approximately three months, according to CA. The company would not specify when it would offer a local-area network implementation.

"With PCs on-line to the mainframe, security administrators have had to treat PC security differently from the mainframe, both in concept and the array of interfaces they have to use," said Donn Parker, president of SRI International, a security consultancy in Menlo Park, Calif.

Glinda Cummings, manager of data security at North Carolina National Bank in Dallas and chairman of the Southwest Area Top Secret users group, said she will purchase CA-Cortana when it becomes available because it offers many of the same features as CA's mainframe security software.

"Although many people don't want PC security," she said, "we use PCs for a wide range of functions and have a lot of data files sitting out on PCs."

Shaku Atre, president of Atre Computer Assistance, Inc., a subsidiary of Coopers & Lybrand located in Rye, N.Y., predicted that "large corporations will only secure a few PCs" and that CA will fare far better with CA-ACF2/DB2 and CA-Top Secret/DB2.

According to Atre, IBM's alternative, RACF, "is extremely cumbersome with or without DB2." Although DB2 offers its own security, many organizations that use DB2 already use either CA-ACF2 or CA-Top Secret, and they will be looking for commonality of security functions.

Long time coming

According to Cummings, both ACF2 and Top Secret users have been waiting for DB2 security software for a long time.

"Users are looking for features that they already know," she explained. "If you can do the security within Top Secret or ACF2, you might be able to cut down on the overhead in using DB2."

CA-ACF2 and CA-Top Secret will enter beta testing in the second quarter of 1990, with availability in about four months, the company said.

Prices for each range from $12,000 to $25,000, depending on the processor size.

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A chip off the old block. The new HP LaserJet IIP printer (front) with the best-selling powerhouse LaserJet Series II

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The new HP LaserJet IIP printer.

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HEWLETT PACKARD

Lotus hopping on the service wagon

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Outsourcing and the increasing sophistication of desktop software have triggered a growing emphasis on service at Lotus Development Corp. and the pending launch of at least one new program.

Users need help getting up to speed with the new breed of software, analysts said. "Notes, for example, requires a lot of handholding," said David Bayer, an analyst at Montgomery Securities.

"We need to bridge the gap between what resellers can do, what we can do with a hot line and what customers are asking for," said Heidi Sinclair, Lotus' vice-president of corporate communications.

Lotus currently has two pilots under way to test two new service concepts, one of which will go on-line by March:

- An in-house unit is providing custom applications services to four Agenda users.
- Taking a page from Aldus Corp., Lotus is experimenting with a 900 number that guarantees immediate response. The test involves a group of customers whose traditional six months of free support are expiring.

Faced with the imminent delivery of its OS/2- and host-based spreadsheets, Lotus has found it necessary to go beyond talk.

"What we are looking at in a very serious way and will do by the end of this quarter is to launch an applications services business," Sinclair said. "This means we will go out into customer sites and develop on-site applications, very much like a mini-Arthur Andersen."

"It's an exciting prospect. Large companies, whether they are doing well or not, are all downsizing for a variety of reasons," said Ron Goldfarb, manager of new technology at Pratt & Whitney Co. in East Hartford, Conn.

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PC MAGAZINE
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March 28, 1989

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Intel to spice chip menu

BY RICHARD PASTORE
CW STAFF

Vendors and power-hungry users — champing at the bit for Intel Corp. microprocessor rollouts — will take delivery of two speedier models in the next six months. But ironically, the economy-minded 20-MHz 80386SX chip may make a bigger splash than the turbo-charged 33-MHz I486, analysts predicted.

The 20-MHz 386SX will make its appearance this quarter, according to Intel.

Observers agreed that the chip will assuage pent-up user demand for a speedier version of the hot-selling 386SX, which allows users to run 80386-based software without committing to the expense of a 386-based machine.

The currently available 16-MHz 386SX actually runs DOS software a bit more slowly than Intel's 16-MHz 80286 chip, according to Dean McCarron, vice-president of technology at In-stat, Inc., a market research firm in Scottsdale, Ariz.

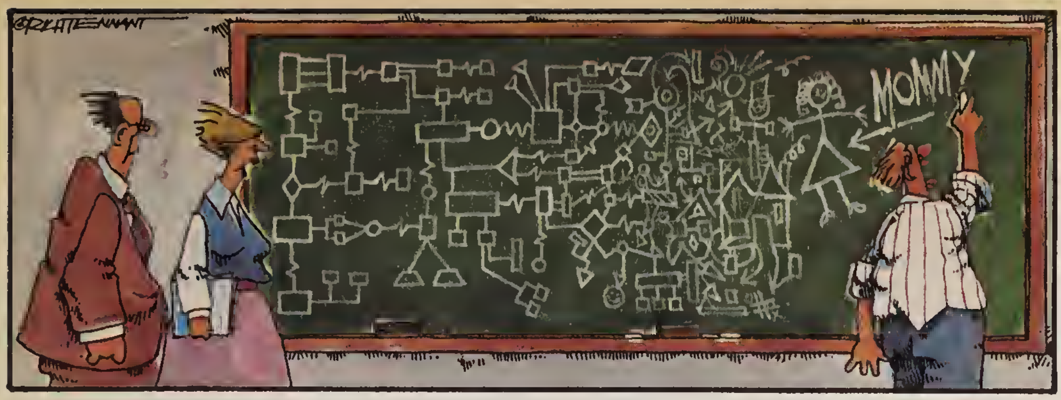
"Right now, the 386SX doesn't offer a performance advantage over the 286." McCarron said. "When the 20-MHz [chip] arrives, the performance advantage will come to light."

Pricing for the chip will likely run approximately 20% to 25% more than the 16-MHz version, McCarron estimated.

The 33-MHz I486, Intel's fastest microprocessor, will debut by midyear, the firm said. However, that introduction will probably not match the impact of the 386SX debut, analysts said.

"The 33-MHz [chip] isn't as big a deal because the speed of even a 25-MHz 486 is so blinding," McCarron added.

In addition, there are virtually no 486-based machines shipping, so users have not had time to experience the chip at 25 MHz.



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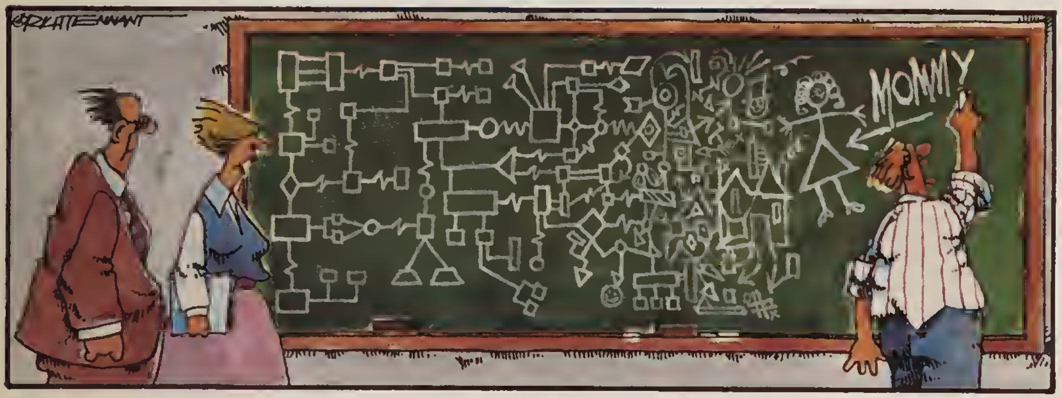

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ADVANCED TECHNOLOGY

Edging down the road to voice recognition

While valued for limited, specialized use, widespread implementation is not yet in the cards

BY MICHAEL ALEXANDER
CW STAFF

Voice-recognition technology is seductive, conjuring up images of users effortlessly performing a variety of tasks using spoken commands.

At Burlington Industries, Inc., for example, quality control inspectors use speech recognizers to enter information about defects that are spotted on yards of textiles streaming by on frames slanted at 45 degrees. The inspectors are more accurate and have been able to shave 25% off the time it takes to grade the quality of the fabrics.

However, the technology still has a way to go before it can be widely used. While there are many potential commercial uses for speech recognizers, the applications currently in place are limited and highly specialized.

Even the most advanced voice-recognition systems cannot process speech without first putting unnatural limitations on the speaker. Invariably, there are trade-offs between the size of vocabulary that a system can understand and its ability to process words accurately. Many systems do not recognize the typical cadence of human speech and require the speaker to pause between words and speak more distinctly than usual.

A limited vocabulary

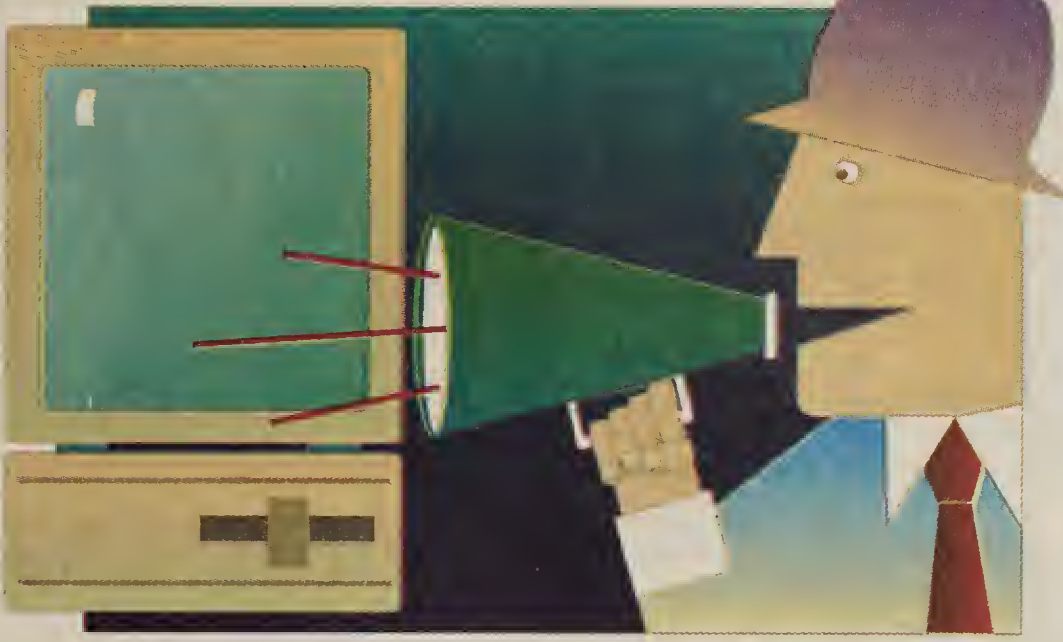
A large vocabulary for a speech recognizer is considered to be 1,000 words, about half of what people use in a normal day, and not at all close to the average person's vocabulary size.

"Unrestricted input in an unrestricted environment is not in the cards in our lifetime," said Jay Wilpon, a researcher in the speech research department at Bell Laboratories in Murray Hill, N.J. "It is the Holy Grail of researchers."

Voice recognition has been a commercial reality for 15 years, but the market has not developed as rapidly as proponents of the technology had hoped, according to Kenneth Bosomworth, president of International Resource Data in New Canaan, Conn.

Annual sales of voice-recognition systems are between $15 million and $20 million, about what they were 10 years ago. What's different is that the products have changed and the technology has become more expensive.

"Back then, you could get a plug-in card for a personal computer for $4,000 that did not work; today, you can get one for $9,000 that almost works," Bosomworth said.


TOM MONAHAN

Most vendors are marketing small systems with vocabularies of fewer than 1,000 words for specialized applications such as taking inventory.

Dragon Systems, Inc. and Kurzweil Applied Intelligence are the only two firms currently marketing commercially accepted voice-recognition systems with large vocabularies (more than 1,000 words), according to Janet Baker, president of Newton, Mass.-based Dragon Systems.

Both companies have developed voice-activated typewriters that recognize spoken words and convert them into text within an off-the-shelf word processing program.

Dragon's voice-recognition typewriter system, called Dragon Dictate, consists of a plug-in card for a personal computer, microphone and software. The board plugs into an AT-standard bus IBM Personal Computer or compatible with an Intel Corp. 80386 microprocessor, 6M bytes of random-access memory and a hard disk drive. A complete setup, excluding PC, costs about $9,000.

The voice typewriter is not aimed at skilled typists but at professionals who do not wish to type and others who need to capture data while their hands are occupied. "Anyone can out-type this system, but it is faster than handwriting," Baker said.

Lenox China in Pomona, N.J., has five employees in quality control and one employee in inventory control using 1,000-word voice-recognition systems developed by Dragon Systems. "Our expectations have been right on target," said Martin Klaver, manager of operations analysis.

The voice-recognition hardware, Dragon's Voice Scribe-1000, is plugged into Compaq Computer Corp. Deskpro 286s and IBM PC XTs with Intel Corp. 80386 add-in cards.

The quality control inspectors sit at a belt production line examining each piece of china for defects. If defects are noted, the piece's disposition, routing for additional work and other information is entered into the voice-recognition system.

"With the high value of these products, we need to know right away what to correct to reduce losses," Klaver said.

The benefits of using the systems are that they reduce the time collecting and then accessing information as well as eliminating completely the cost of data collection because one person can perform inspection and data collection tasks simultaneously.

In inventory control, Lenox previously had a person writing a ticket on each product after final inspection. Then the tickets were summarized and information taken to data processing and keyed in. Using the voice-activated hardware, the ticket is filled in verbally and automatically entered into the computer system. The same job is now done with two fewer employees, and the information is more timely and available for shipping personnel 24 hours sooner.

Not for neophytes

Even before I sat down in front of Dragon Systems, Inc.'s voice-operated word processor, Janet Baker, the firm's president, was quick to tell me that it is not for journalists, computer programmers or anyone else who may be a skilled typist.

Instead, the Dragon Dictate, a speech recognition board, microphone and software designed for Intel 80386-class personal computers, is aimed at a large group of end users who must capture data while their hands are busy doing something else as well as executives and professionals who are loath to type, she told me. Some other likely candidates for the system include medical personnel, air traffic controllers and people with certain disabilities, Baker added.

Still, I wanted to try what Dragon Systems, founded about seven years ago by Janet and James Baker, touts as the "world's first general purpose voice typewriter." Besides, I am not that fast a typist.

Words are entered into the voice-recognition system — in this case, a Compaq Computer Corp. 386-based transportable — with a headset microphone.

I began with the intention of entering, "Now is the time for all good men to come to the aid of their party." Entering that line into the computer was time-consuming, even laborious. Each word had to be spoken distinctly, and I had to pause between each word, taking care not to smack my lips or exhale loudly because both actions caused unintended words to appear on screen. Talking to a machine made me nervous, which caused me to make errors, and I had to fight an urge to begin typing when I became impatient.

Nearly every other word I spoke appeared as something else on the screen. Correcting each mistake was time-consuming, too. I had to use the PC's keyboard in most instances to expedite the process. Baker assured me that as time went on, the machine would begin to adapt to my speech patterns, and my error rate, which was about 50%, would gradually fall to 10% or less after a few hours. An experienced user can expect to achieve a throughput of about 35 words per minute, according to the company's marketing literature.

In all, it took me about five minutes to enter about half of the phrase, not counting time spent getting further instruction.

A researcher, obviously comfortable with using the voice-recognition system, took my place and was able to enter the entire phrase in less than 30 seconds.

MICHAEL ALEXANDER

EDITORIAL

IS-crow accounts

When you fly with the crows, you get shot with the crows.
—Anonymous

IN THE CASE of the behemoths of information systems management, the little aphorism above should be modified to include *"and get paid like the crows."* This is borne out by our story this week (see page 1) on the compensation packages being awarded to the nation's IS elite.

The good news is that top IS executives are being paid more than ever in relative terms and very handsomely in absolute terms. Salaries in the uppper six-figure range are no longer uncommon, and it appears that some have even broken into the million-dollar club.

The bad news is that CIOs are losing their jobs faster than ever before. You only need to look at the long list of high-level departures in 1989 to realize that.

Welcome to the fast track. IS professionals, after laboring years to earn the respect of senior management in the way that perhaps matters most, are fast achieving pay parity with their brethren in sales, marketing and other managerial tracks.

Even the manner in which compensation is earned, with bonuses contributing up to 50%of some IS executives' salaries, reflects a reality in which these individuals and their senior staff are considered as integral parts of the overall management structure.

There is no reason why such a reality should not become more widespread. After all, in the opinions of most top-ranking, non-IS executives, information systems holds *the* key to competitive advantage during the 1990s, according to a study conducted by *Computerworld* last year [CW, April 17].

Ask any of the IS executives earning salaries deep into six figures for a justification of their earnings, and they will undoubtedly point to performance pressures that are far different from what they may have been subjected to a decade or so ago.

It is one thing to gain points for cleaning up an applications backlog or bringing a new report generator on-line. It is quite another to plan, design, implement and then manage an IS environment that demonstrably increases profits and/or market share. It is for carrying the latter yoke of responsibility that members of the IS elite earn what they do. And bearing this responsibility also explains why turnover rates among senior IS executives are as high as they seem to be.

Are visionary IS executives worth all this money? Judging by the accomplishments of some of the top-paying companies, including American Airlines, Federal Express and Baxter Healthcare International, the answer is an emphatic yes. After all, they have changed the rules in their respective industries.

But there is likely to continue to be a big delta in the financial rewards enjoyed by the top CIOs versus those who are content simply to process data. The IS challenge of the '90s is to "re-engineer" the corporation. It's becoming clear that those who can do so can benefit mightily from it.

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COMING OUT PARTY
PRESS

LETTERS TO THE EDITOR

Manson's muses

I read with interest Steve Manson's "Industry Insight" [CW, Oct. 2]. Manson reports that application portability continues to be a high priority. Vendors have capitalized on this need for portability by convincing customers to standardize on their database products.

If only applications could be moved between databases, Manson muses. Users would no longer be "locked in" to a single database product or proprietary development strategy.

The good news is that what Manson claims to be "almost a reality" is in fact reality today. What was formerly lacking — a means for developing applications that can run independently of the underlying database — can be realized with the proper application development tools.

What Manson is suggesting can be referred to as database-independent application development. Applications developed with Smartstar, for example, will work on a number of the major relational databases with little or no code modification. A completed application can be migrated intact from one database type to another — from Oracle to RDB, for example. The conversion of data and data definitions is handled automatically.

David Baum
Smartstar Corp.
Santa Barbara, Calif.

Train the trainers

Regarding Bill Sebrell's article against the use of volunteer instructors [CW, Oct. 9], many of his assumptions are correct if considered in theory only. However, reality dictates that assumptions should be fully tested before implementation (a lesson IS techies all learn sooner or later).

His main premise: "The approach has not proved successful in the past, and the likelihood of future success is even more limited" was refuted three weeks earlier in an article by Sue Redkey [CW, Sept. 25]. Unum's methods have proven to be quite successful by all measurable standards. A good manager and researcher would have pursued this success — to determine how it was accomplished — before going to print claiming the method will not work.

I agree with this statement that "it doesn't make economic sense to gamble on the delivery . . . by using an untested volunteer over whom there are virtually no checks." Are there alternatives? Certainly. Train the trainers! Evaluate the educational needs and utilize outside "professionals" when necessary.

We at Unum have certainly learned some lessons the hard way, and we have learned that every technician is not a good teacher. Nevertheless, here are some of the positive lessons we have learned:

- Techies are teachable — i.e., you *can* train people with valuable skills how to pass those skills to others.
- Some courses cannot be taught by "in-house" professionals because they do not have the knowledge of the product . . . so we learn to be selective.
- Once you know what skills are necessary to be a good teacher, you can design courses to help volunteers better their organization and presentation abilities.

We do have checks in the system. We give aid to systems people in designing courses. We provide the opportunity for trial runs (or walkthroughs) to help new volunteers hone their teaching skills. Most importantly, however, we *do* work with a volunteer's manager so the primary tasks are not neglected.

This system works only if it gets full support from corporate management and a positive attitude exists about the process.

William P. Whelan
Unum Life Insurance Co.
Sebago Lake, Maine

Future baby doom

I agree with Glenn Rifkin's "Viewpoint," [CW, Dec. 11]. The child-care situation in the U.S. is a disgrace and will only get worse as the pool of workers shrinks and more women make up the work force.

The annual growth of workers joining the labor force is slowing from the 2.2% rate during the period from 1972 to 1986 to a projected rate of just 1.2% from 1986 to 2000. Women are projected to account for more than 60% of the labor force growth between 1986 and 2000.

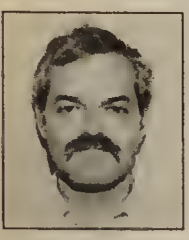
What is going to happen to our children? Based on the demographics of the years ahead, women will not be at home but in the work place. Employers will have to come to terms with this situation and address their employees' needs for child-care options.

Anne M. Stone
Bettendorf, Iowa

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

IRS falls to cost/benefit bunk

JEFF ANGUS



The Internal Revenue Service's (IRS) $1.8 billion investment in automating the examination of tax returns was money flushed down the toilet, according to the U.S. General Accounting Office (GAO). The GAO's study, released in June, said that the benefits were 63% lower than the IRS technology group had predicted, and the four-year implementation plan has turned into a 10-year period to get the program running.

The sad thing is this: The GAO is correct that the IRS blew the planning of its computerized system. Even sadder is the GAO's study methodology, which, like all current cost/benefit analyses, is a useless way of examining the benefits of an automated system.

The problems the IRS welded into its system design ranged from the obvious to the rare. On the obvious side, the IRS bought its 18,000 laptop computers for field agents in 1984 — a full year before the software design was even started. Thus, when the program was finished, it resided on 18 different floppy disks, forcing frequent disk swaps for the system to work. The "hardware first, software second" planning fiasco had struck again.

The software was built before the IRS' information systems function had completed a project to standardize IRS-wide data definitions. Thus, the data in the laptop-based system can't always be correlated to the rest of the information the IRS has, rendering the system less effective.

The IRS had two additional problems. First, in the face of the Reagan administration's attempt to privatize much of the government, the IRS used contractors for much of the project. The contractor on the project, according to the GAO, was inexperienced in analyzing and writing up user requirements.

Government hiring patterns also threw a wrench into the gears. The system was originally written in Turbo Pascal, but staffing requirements pushed the IRS to clear the decks of programmers with that language skill. So after the system was written, it was rewritten in C so it could be maintained. That was just a small tactical error in this fiasco, however. Rewriting a system built in one language to another tends to be as expensive as starting from scratch.

The GAO also stated that the system builders made another pandemic mistake — both IRS' IS and the contractor underestimated the level of detail needed for programming a large, complex system.

In sum, the IRS used inexperienced contractors to design a project it grossly underestimated to run on inappropriate hardware with no logical connection to other needed data. That wasn't the worst of it, however.

STUART GOLDENBERG

It was the subtle problems that killed the IRS' automated audit plans.

The IRS failed to adequately integrate the field agents into the design of the system. The users, IRS field auditors, should have designed the system with the guidance of IRS' IS group.

For the IRS, this problem was almost inevitable. Contractors don't get paid by field auditors; their highly lucrative work depends on upper management. Federal contract officers are only concerned about proper paperwork and delivered products — that's their job.

In your firm, you probably don't have the same excuse. New prototyping tools allow line workers with a minimum of computing experience to design forms and functions that make productive sense to their work cycles and requirements. User-prototyping creates a bond of commitment between IS and the end user and builds mutual respect for each other's job skills.

The GAO found that 77% of the field agents were dissatisfied with the system. Two-thirds wouldn't use it. Many of the field auditors' managers expressed serious doubts that the system could ever save the agents time.

The other subtle problem is endemic, even in quality shops — the belief that technology is the fix. It's not. Buying 18,000 laptops to mobilize auditing isn't a solution. Buying customized software isn't a solution. These are pieces of a solution.

The solution is better integration of work through whatever means, including automation. Good IS implementation goes beyond the realm of automation, incorporating the perceptions and analytical skills of the IS staff into work solutions, whether or not computing is involved.

Even with all those blunders, we can't truly know whether the IRS effort was cost ineffective, because as clever as the GAO is, it is bound by the mindless pablum of cost/benefit accounting.

A pseudo-science-like astrology, cost/benefit analysis views work through a purely quantitative filter. Aspects that can't be readily evaluated through a numeric measurement are ignored.

Using cost/benefit analysis, it couldn't find out what effects the system had on the accuracy of the audits. It couldn't assess the long-term effects of the system on the auditors. As bad as the technology planning has been during the last decade, it's not as dangerous as the reign of accountancy in our economy.

Until we free our firms from the rule of bean-counters and turn them into useful partners in development, their warped view of reality will continue to propagate weak systems.

Angus is a manager at Farallon Computing, Inc., a manufacturer of Macintosh networking hardware and software in Berkeley, Calif.

Is this the beginning of the end for IS professionals?

JOHN KIRKLEY

How secure are you feeling in your job these days?

If your answer is "not very," welcome to the club. These are trying times for anyone in the corporate world. But for information systems managers, there seems to be an added element of insecurity. When you read about IS departments being "outsourced," firms turning to facilities management operations and the dismemberment of IS functions, it does seem a bit unsettling.

Could it be that we're witnessing the end of a profession? Has a challenging way of making a living had its day in the sun? Is the once bright occupation of the IS professional slowly fading?

Could be. If you've been thinking about becoming a woodworker in Vermont or raising grapes in Sonoma, it may be time to dust off those old dreams.

The IS profession has had a valiant, rewarding, but relatively short history. After all, we're talking about a job that's existed for only a little over 30 years.

But what's really going on? Our concern is the relative clout, the level of importance and visibility (and hence, reward) for the IS function as an independent entity. We're talking about power.

These days the power is shifting from those who control the technology to those who control the applications. And many key applications are migrating from IS into the enterprise's operating departments.

We know most of the reasons: the rise of end-user computing, the personal computer and workstation revolution, the growth of usable, affordable communications networks and the growing importance of information processing to the strategic goals of the corporation.

We've discovered that successful applications can only be created by IS with heavy involvement by the businesspeople who will be the ultimate users. This is just one stop in a more pervasive movement: In many organizations, all the applications, and with them, the applications developers, will find new homes in the user departments.

Remaining in the data center will be the infrastructure, the pieces of machinery, the wires and cables, as well as all the rest that's needed to move and crunch data for the businesspeople who run the applications. As one IS manager said, "The DP people will be like the guy who raises the flag in the morning and the people who take care of the air-conditioning and heating. You won't think about them very much — until something breaks. And then you just want it fixed so you can get on with your business."

Advantageous trend

Another interesting trend is occurring as well. In many firms, the massive amount of processing that takes place has evolved into a commodity function.

Think of processing insurance claims, handling checking accounts, slogging through mounds of credit-card applications — absolutely indispensable functions but strictly nuts and bolts.

These types of operations tend to cluster together into economy-of-scale sizes. Therefore, companies are beginning to look to outside organizations that specialize in these services. A company like Boeing Computer Services is a likely candidate to handle medical claims processing, insurance renewals, credit cards, circulation fulfillment and the like. The application doesn't really matter; it's the ability to handle massive amounts of raw data that counts.

Other enterprising businesses, such as banks and insurance companies, are setting up the needed economy-of-scale operations as separate subsidiaries and are offering these specialized services to their competitors. In the banking business, it's conceivable that one bank may become a processing specialist in credit cards, another will handle the industry's letters of credit, another direct deposit. The banks will become marketing organizations, competing on the basis of service and financial expertise, rather than on which has the most elaborate IS operation.

So, on one hand, as the applications move out to the user, the technology gets absorbed into the business, leaving an infrastructure that is a far cry from the glass-encased computer rooms of old run by DP wizards.

On the other hand, the power that comes with controlling the application is absorbed into a commodity operation geared to handle massive amounts of repetitive processing.

In this admittedly oversimplified scenario, the IS professional who wishes to maintain a relatively high level of status, power and earnings, must subsume his or her technical skills into a larger business environment. One alternative is to become part of enterprise management in a new, much broader corporate role in which technological expertise becomes a necessary but secondary skill. The other possibility is to head up one of the large commodity processing operations that requires its manager to emphasize strict cost controls and quality of service.

In both of these scenarios, the IS professional's technical skills become submerged in a larger arena.

If you discover that neither of these alternatives is to your liking, and you are hard-pressed to come up with other options, perhaps the only response to the situation is: "See you in Sonoma."

Kirkley is a computer industry writer, editor and consultant based in Warwick, N.Y.

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SOFT TALK

Thomas O'Flaherty

Missing pieces

Recently, I attended a product sales presentation made by a leading vendor of IBM mainframe performance management software. This was the classic sales "seminar": It was very informative on IS issues put in the context of a low-key introduction to a vendor's products.

I had attended a similar seminar by the same vendor about eight years ago and was pleased to see how the company had prospered in the meantime: It offers an elegant set of very useful products.

The complexities and opportunities in managing an IBM MVS installation were presented clearly, and the technology-oriented audience responded well. I was, however, struck by how little the thrust of the seminar had changed since the early 1980s.

- The bulk of the presentation

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DEC faces support challenge

ANALYSIS

BY MARYFRAN JOHNSON
CW STAFF

While the IBM field representative strolls in the front office door to chat up the chief executive, Digital Equipment Corp.'s field representative is more likely to slip in the service entrance.

That may be changing. "The DEC service pro is traditionally low-key, someone who meets with technicians and people using the systems," DEC spokesman Nick Houpis said. "That's part of an image we're quickly dispelling."

A few of DEC's larger customers have already spotted signs of the IBM-like hand-holding and on-site support so crucial to the corporate data center on which DEC has set its sights with the VAX 9000 mainframe.

However, others say the Maynard, Mass.-based minicomputer company has yet to display the in-depth knowledge of individual business needs so crucial to holding mainframe accounts.

"DEC has to adapt to IBM's [service] delivery strategy and approach in large accounts," said Don Goodspeed, vice-president of service and maintenance strategies at Meta Group, Inc. in Westport, Conn. "They have the raw materials in place to do it. It's putting it all together, packaging and delivering it and providing the value-added. That's their challenge."

Recently, at Prudential-Bache Securities, Inc. in New York, MIS director Bill Anderson sat through a major presentation by senior DEC officials on DEC's trading systems software.

"They went through all their trading systems, but they didn't have one person looking at *our* trading system," Anderson recalled. "We had a good percentage of [DEC's trading software] already, and they didn't even know it."

That experience led Anderson to conclude that DEC is not ready to provide the kind of systems engineering support and understanding a mainframe account demands. Yet, the execu-

Continued on page 28

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- Enterprise Integration Services — senior-level consulting for VAX 9000 mainframe or Vaxcluster buyers.
- New "node service" for large Vaxcluster customers, who can now buy right-to-copy software for their nodes instead of paying for separate licenses.
- A network management service called Shared Network Support, with DEC providing backup for customers.

Computer challenges EKG as heart saver of future

BY MARYFRAN JOHNSON
CW STAFF

MINNEAPOLIS — No needles. No treadmills. No stress.

Just a gentle, painless, high-tech way to identify potential heart attack victims before that dreadful rush to the emergency room.

That is the promise held out by a new computer-driven screening tool now in use in one British hospital and under clinical testing at four U.S. health centers.

The Cherne Digital Cardiac Diagnostic System, which measures electrical impulses from the heart to detect abnormalities in blood flow, relies on powerful workstation technology and a proprietary software program developed by computer engineers at Cherne Medical, Inc. in Minneapolis.

The system could provide

Continued on page 29

Cherne's cardiac diagnostic *system could replace EKGs*

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British Telecom takes 'open' advice

ON SITE

BY AMY CORTESE
CW STAFF

LONDON — British Telecom, provider of telecommunications services to 24 million people, is as well known to natives as nearby St. Paul's Cathedral is to tourists. But unlike the city's great architecture, which can withstand the march of time unchanged, British Telecom has had to respond to a changing business and technological environment.

Originally part of the government-owned postal service, British Telecom came into its own in the early 1980s as part of Prime Minister Margaret Thatcher's privatization program.

In the private sector, British Telecom's operations have become more complex, and the demand for applications has mounted steadily. To keep this growth and increasing complexity under control, British Telecom has set out a framework based on open systems and standards.

"Open systems is the only way forward," said John Spackman, director of computing and information systems for British Telecom. Like many large firms, British Telecom has found itself faced with diverse systems that do not communicate with one another. The Computing and Information Service is the primary source of IS services for British Telecom UK, with 5,000 employees; 57 large mainframes from IBM, Digital Equipment Corp., ICL Ltd. and Amdahl Corp.; and over 60,000 terminals and personal computers.

British
TELECOM

Spackman's vision is to tie all these together through standards and a consistent development environment. "You have to have an architecture, strict architectural rules that define how you connect," Spackman said.

His company has gone the route of standards, choosing Open Systems Interconnect (OSI) over proprietary alternatives as its backbone network. Further, the firm has standardized on AT&T's Unix System V for the midrange and is considering its potential for desktop and mainframe platforms as well. IBM's SQL is mandated for data management on all platforms, and Spackman would like a standard SQL interface as database engines become commodities.

Spackman's approach to IS is pragmatic and forward-looking. "No company has a grip on the future. To shut yourself out from others is unthinkable," he said. "There is no way BT will commit permanently to IBM. The only option is to go for a vendor-independent, open network architecture."

Although currently using a mix of proprietary and Unix-based systems, British Telecom has started to carry out a companywide migration of all departmental and office systems to Unix and Oracle Corp.'s database management system. While Spackman said he believes that Unix will prevail over OS/2 for the desktop, an efficient mainframe Unix implementation will be a long time coming and, thus, the IBM mainframe environment still figures prominently at British Telecom.

IBM MVS supports a recently introduced, strategic Customer Service System (CSS), with which British Telecom combined all customer information into a single database. CSS uses Computer Associates, Inc.'s IDMS/R to hold 140 million database records and process 500,000 transactions per day.

Spackman *believes open systems are the way to go*

Although Spackman is not uninterested in IBM's AD/Cycle development strategy, he noted that it is "very much related to the IBM [Systems Network Architecture] environment." Since his firm is phasing out its SNA communications in favor of OSI, AD/Cycle "won't be the basis for [British Telecom's] mainstream development, unless or until it is a multihost and open environment," Spackman said.

Instead, he envisions what British Telecom has termed an Open Development Environment. His ambition is to build a fully integrated product development and support environment that encompasses everything from business modeling, design and code generation to configuration management and project and quality management. British Telecom also has embarked on a major computer-aided software engineering (CASE) initiative.

The software engineering program was undertaken for three basic reasons: to decrease development costs, to improve the quality of applications and to control the increasing complexity of applications. After extensive research and discussions with experts, Spackman chose object-oriented technology. Other requirements for British Telecom's software engineering environment include vendor and methodology independence.

To accomplish these goals, the firm chose a CASE offering from Softlab, Inc., a software firm based in West Germany. The product, Maestro II, consists of an object-oriented database running on distributed Unix servers with IBM PC front ends. The development environments, however, include IBM mainframe, DEC VAX, Unix and OS/2 environments. Ultimately, all development will be done using the Softlab environment.

British Telecom expects system engineering to result in faster development, reduced costs, process and product control and enforcement of standards.

HP restructures low-end disk systems, adds DAT

BY ROSEMARY HAMILTON
CW STAFF

Hewlett-Packard Co. recently gave its disk storage product line a major overhaul by announcing a replacement line for the 7900 series of subsystems and two other disk storage units targeted at low-end HP workstations.

At the same time, it rolled out its first storage unit based on digital audio tape (DAT) technology.

The HP Series 6000 Models 335, 670 and 1.34 will replace five units in the 7900 series and can be used with HP 1000, 3000 and 9000 systems. The new subsystems use a 5¼-in. format instead of the previously used 8-in. format, allowing users to pack more data into each unit. The high-end model holds 1.3G bytes of data, whereas the maximum capacity of the old subsystems was 571M bytes.

Because of the increased capacity, HP said users will save up to 50% on a cost-per-megabyte basis. Depending on the configuration, the models cost less than $12 per megabyte, HP said. The new subsystems also reduce power requirements by 50%.

The company, which plans to begin shipments next month, said the units have a starting price of $5,275.

HP also released the Series 6000 Models 330S and 660S, each of which is equipped with a small computer systems interface (SCSI) for use with HP 9000 Series 300 workstations.

The firm will try a new packaging technique with these drives. Each unit will come with two extra slots to which users can attach various storage devices, including a new DAT device HP has just released.

This packaging technique will reportedly cost users less money than buying the additional storage devices as stand-alone units. In addition to the DAT unit, users can opt for a compact disc/read-only memory device, a rewritable optical disc drive or more hard disk drives.

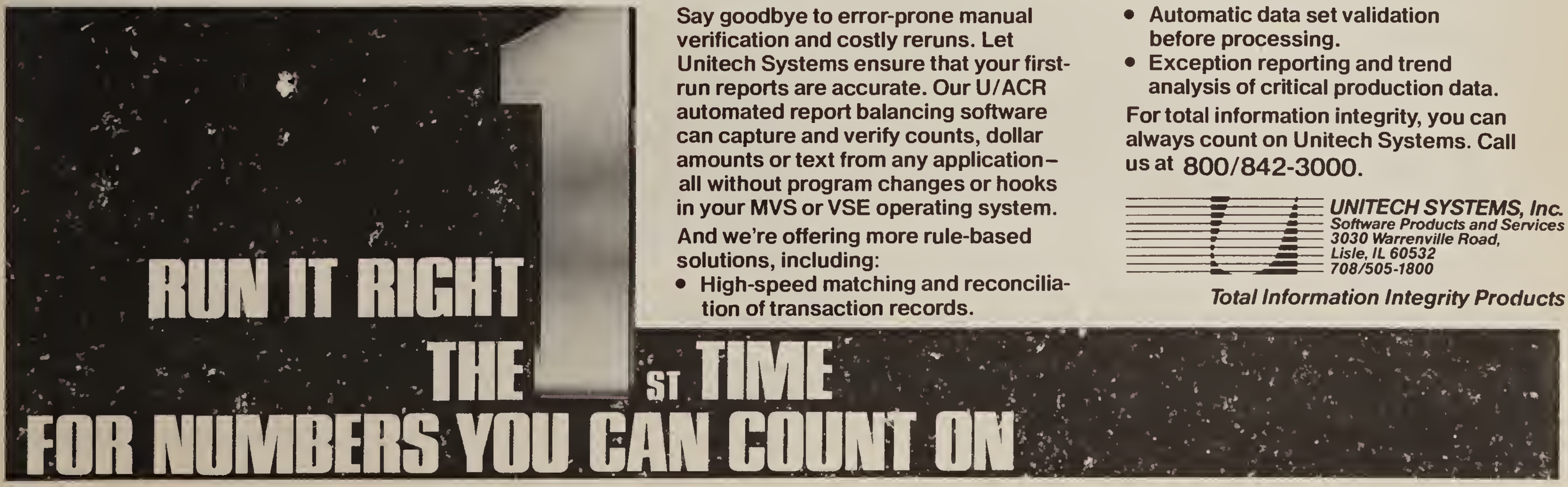
The DAT unit comes in two versions, the SCSI model and a stand-alone subsystem with an HP-IB interface. The drive, based on helical-scan technology, would allow users to back up as much as 1.3G bytes of data in less than two hours, HP claimed. Also, operator intervention is not required for backups.

HARD BITS

Storage Tek acquires M4

Storage Technology Corp. wrapped up its deal with M4 Data Ltd., a maker of tape drives that is based in the UK. Storage Tek, which bought the company for an undisclosed amount of cash, said it fit with its strategy to offer smaller, high-capacity drives.

Bell Atlantic Data 3, a subsidiary of Bell Atlantic Capital Corp., opened an Application System/400 educational center in the Dallas area. The firm claims to have staffed the center with former system engineers from IBM, and it will provide basic introductory courses as well as advanced programming workshops. Bell Atlantic said the center is part of its plan to offer services beyond hardware maintenance.



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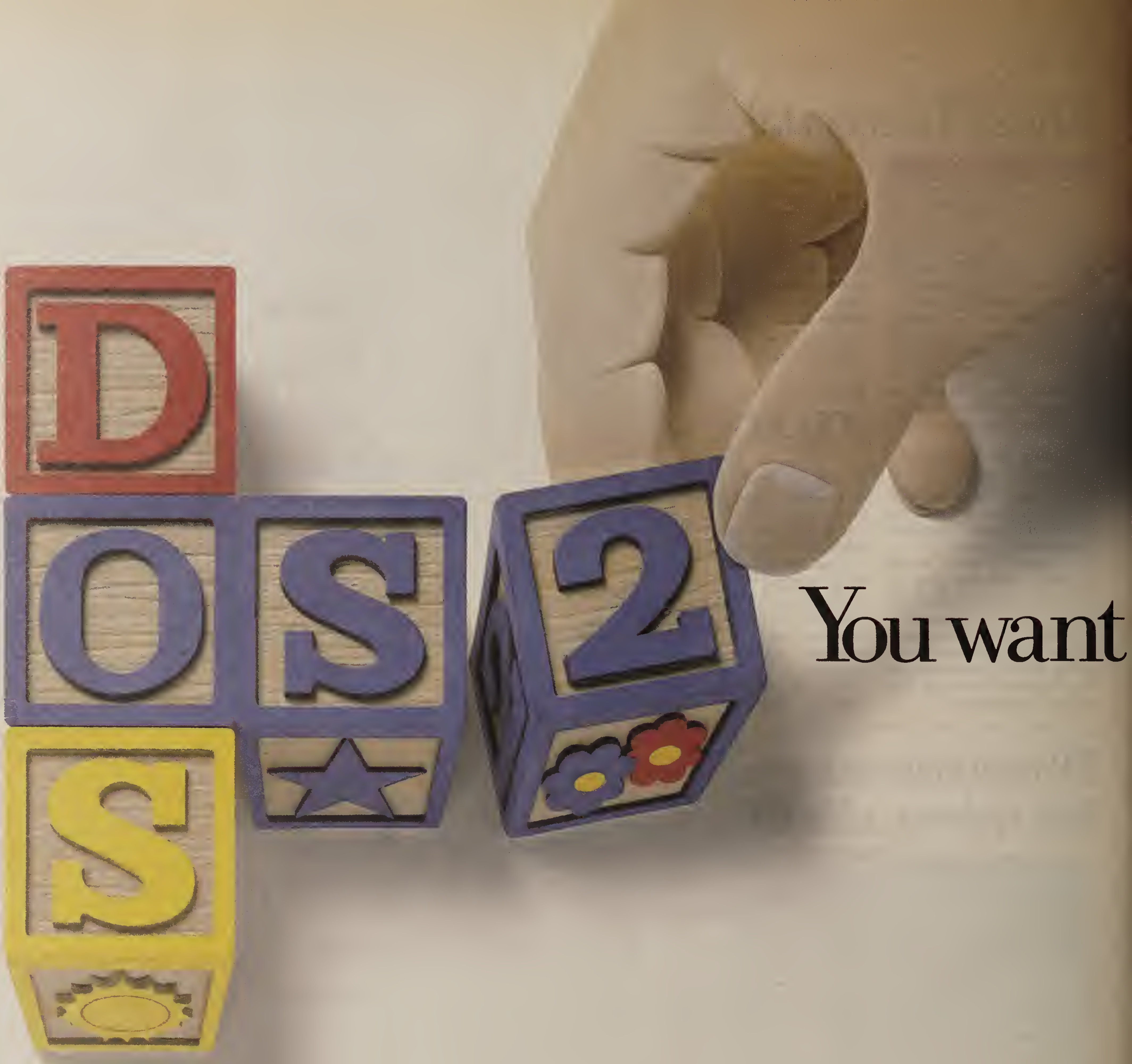
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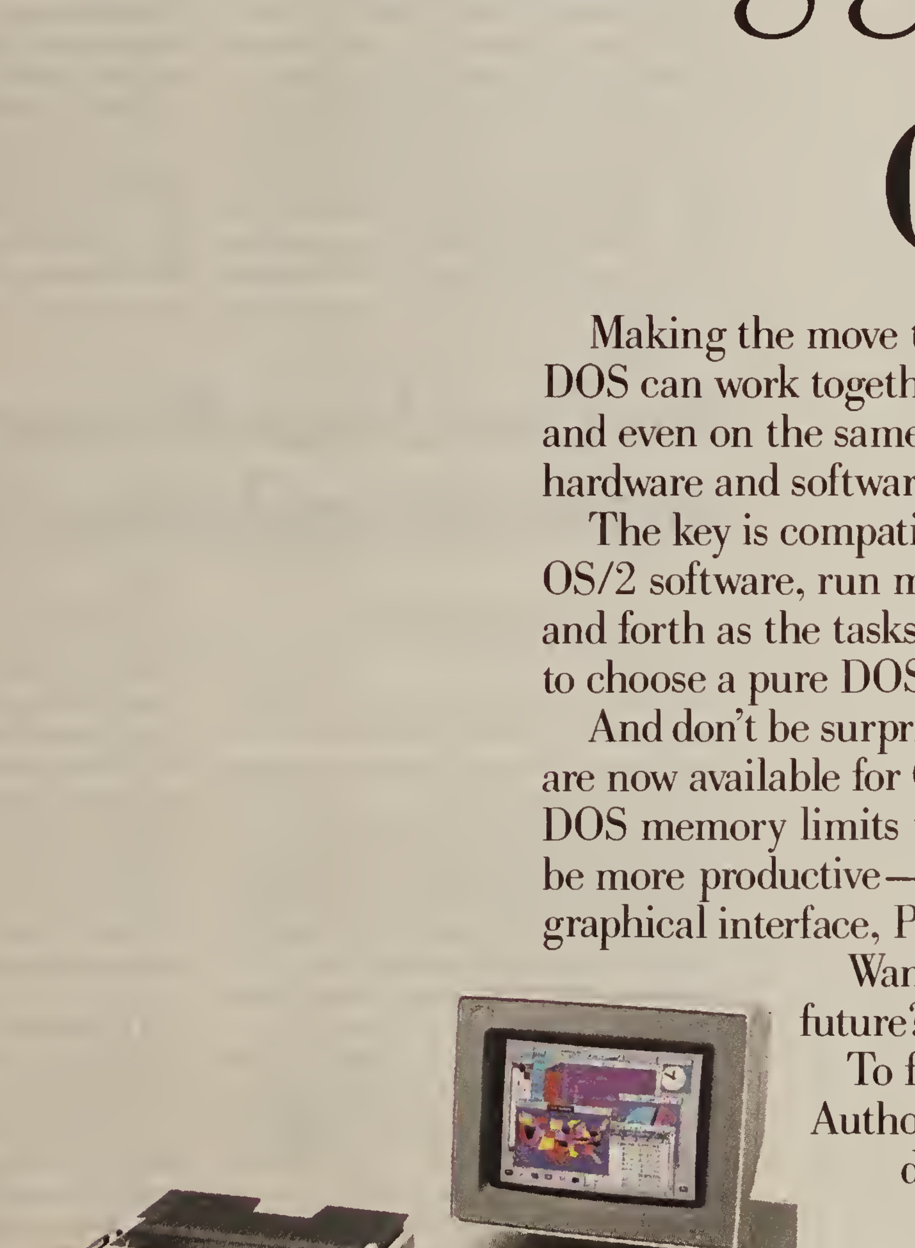

IBM

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THEIR TECHNICAL SUPPORT.

DEC

CONTINUED FROM PAGE 23

tive still gives DEC high marks for making progress toward developing the necessary skills and resources. "I'd say that DEC is far better along that path than they were two years ago," Anderson said.

The world of service is changing dramatically, analysts agreed. "It is no longer really tied strictly to hardware breaking down. It's a whole new market," said Marnie Phillips, an analyst at The Ledgeway Group in Lexington, Mass. "A lot of the services DEC is offering now are value-added services, which follows the trend in the entire industry."

Unfortunately for users, the trend toward packaging bundles of service options ultimately costs more, Goodspeed said. "Vendors are all trying to hold up the price in this area, and users are trying to beat it down."

In a study conducted by Meta Group, DEC emerged with the highest portion — 38% — of its revenue earned from hardware and software services and maintenance. IBM came in at 29%.

Goodspeed maintains that high-tech marvels such as DEC's state-of-the-art customer service center in Boulder, Colo., really do more for the company's image than for a user. "As a user, I'd say, 'Who keeps track of my problems? Who looks at how I'm operating?' " he said. "DEC doesn't. They're too busy looking at how fast they're responding to the kind of questions coming in. So who cares?"

One area that larger customers do care about is software support, said Stan Rose, MIS director at Banker's Trust Co. in New York. While Rose has few complaints about DEC service, he has been working with the company on improving its software support. "As the machines get larger and used by more and more users, there are more mission-critical applications, and it becomes much more critical to solve software problems more quickly," he explained.

DEC promises it will break new ground with the level of service and support delivered with the first installations of the VAX 9000 this spring.

For annual maintenance charges of $66,000 to $74,000, the VAX 9000's one-year warranty comes bundled with 24-hour-a-day maintenance support, on-site consulting and staff training.

Customers can opt for the "Advanced Electronic Support" program — at a cost still undetermined — which supplies an on-site Microvax loaded with predictive maintenance capabilities and artificial intelligence-based hardware and software analysis and access to an on-line customer information network and database.

Another option is the "customer support engineer," a resident engineer who assumes day-to-day responsibility for coordinating VAX 9000 use. While DEC has provided on-site support to large accounts in the past, this program is the first to formalize the engineer's role on the business team.

One faithful DEC customer, Dave Renaud at Grinnell Mutual Reinsurance Co. in Grinnell, Iowa, originally dismissed the talk about team work and focusing on customer needs as nothing more than "marketing hype." Then he saw the field service reorganize itself and the powers of individual managers flourish.

"They've done a lot to eliminate the finger-pointing between hardware and software," Grinnell's technical director said. "Now, instead of what appeared to the customer as an antagonistic relationship appears to be a team effort."

One Pass claims efficiency gains in single-step production reporting

BY ROBERT MORAN
CW STAFF

Must Software International, Inc. recently introduced software that trims the resources needed to run large production reporting systems.

Nomad One Pass, analyzes the data requirements for multiple report requests, figures out what data items are needed to fulfill the various requests and satisfies those requests with a single pass of the database. In the last step, the software formats and creates each report.

Reporting systems generally go through the database for each separate report, taxing computer systems, especially in high-volume batch reporting applications or for multiple reports.

According to the company, One Pass will net users as much as an 80% savings in database I/O, CPU and elapsed time, depending on the application. In addition to accessing data stored in Nomad, the company's database and fourth-generation language, One Pass can access data stored in IBM's DB2, SQL/DS and IMS as well as Teradata databases and Computer Associates International, Inc.'s CA-IDMS.

Using One Pass on a general ledger report that had to be formatted in different ways for different users but required data from the same database, Perini Corp., a construction firm in Framingham, Mass., and a beta-test site user since June, achieved a 50% decrease in the number of passes through the Nomad database to fetch records. In addition, One Pass decreased I/O by 43% and CPU time by 42%, said Kim Holden, database administrator at the company.

I/O efficiency

According to Holden, by issuing a save command prior to running the first report, One Pass knows how to format the output of list requests and saves the I/O that other techniques consume searching against the database for appropriate records.

"I see One Pass as being very beneficial for computer departments that charge back users based on I/O or CPU seconds," Holden said. "One Pass could be saving them quite a bit of money."

The software is immediately available and is priced at between $5,000 and $20,750, depending on the size of the processor.

O'Flaherty

CONTINUED FROM PAGE 23

addressed familiar processor, storage and throughput issues. (I even vaguely recalled some of the time-series graphs from the earlier seminar.)

- Network management was addressed. However, by implication, the audience was still assumed to be living in an essentially "batch" world with "communications" still representing the MVS compromises of 10 to 15 years ago.
- The impact of personal computers, workstations, distributed databases/processing and local-area networks was ignored. In fact, these terms were not even mentioned.

The vendor really cannot be blamed for the missing pieces. After all, it was primarily engaged in selling its bread-and-butter products. It was also obvious, as the seminar progressed, that the vendor had selected its subjects wisely: The attendees were obviously still in something of an MVS time warp. Other material may have been foreign to them.

A striking example of this insularity occurred when a vendor presenter alluded to an upcoming VAX product. He said something like, "It will run under VMS — I know it's a little confusing, sounding so much like VM. You know what VMS is, don't you?" Silence. Finally, someone said, "It's something that DEC has, isn't it?" Whether that person was kidding or not, that was the extent of the interest in performance measurement in a heterogeneous environment.

EVEN LARGE MIS departments find it nearly impossible to keep operations running adequately.

There are many excuses or explanations I could make for the state of affairs that I witnessed: These were technical specialists, traditional performance management is still a critical function, many MIS shops are initiating innovative networked applications and so on.

Even with all these caveats, I found the situation disturbing. At the least many technical planners do not seem to have the time or the opportunity to get involved with leading-edge technical issues. More alarming is the possibility that the weight of the installed base of systems and applications has become so heavy in many installations that "maintenance" in all its forms has become the order of the day.

This may go some way to explain why the provision of professional services — and systems integration in particular — has taken off in recent years. Even large MIS departments find it nearly impossible to keep operations running adequately and make incremental improvements to long-established applications while at the same time mobilizing the resources needed to implement the bold strokes often necessary for attaining business advantage through information systems.

O'Flaherty is vice-president of the New York office of Input, an international research and consulting firm.

Heart

CONTINUED FROM PAGE 23

physicians with a cheaper, safer, more accurate alternative to the stress electrocardiogram (EKG) or treadmill test.

"If the Cherne system proves to be as effective as initial trials have shown, it would have widespread potential for use as a coronary heart disease screening tool," said Brent Mays, a clinical research associate at The Lipid Center, a part of the Humana Heart Institute at Audubon Hospital in Louisville, Ky. Up to 300 patients at the center will be screened by mid-1990 using the Cherne system.

Heart disease is the leading killer of Americans, accounting for roughly half of all deaths each year. In 1987, American Heart Association figures show that 513,700 people died from heart disease.

Listen to your heartbeat

To conduct the 30-minute Cherne test, a technician attaches 22 electrodes to the chest and sides of the patient, who lies quietly while electrical signals from 440 heartbeats are collected and processed by a bedside computer.

The end result is a numerical score of 1 to 150, with the high end indicating extreme risk of heart failure. Factored into the score are risk indicators from the patient's age, height, weight, medical history and cholesterol count.

Cherne Medical plans to lease its machines rather than sell them, said Charles Cuddihy, president of Cherne Medical. For every patient tested with the system, the company will receive a fee of roughly $100.

The original algorithm at the core of Cherne's software program was designed by two university professors, who ran it on an IBM mainframe. They sold the algorithm to company founder Lloyd Cherne, who spent five years and $5 million bringing the system to market.

"This relies very much so on computer technology," Cuddihy said. "Without the ability to crunch enormous amounts of data in a short period of time, it just couldn't happen."

The firm recently began using Aviion workstations from Data General Corp. for research and development work. The bedside computer used as the test instrument is Cherne's own machine, based on the Motorola, Inc. 68020 chip.

The test machine is calibrated by combining data from hundreds of patients. But statistical post-processing was taking months on an older Motorola Delta workstation, so company engineers began looking at more powerful systems.

Now, a statistical run that once took up to five months can be accomplished in six days on the Aviion, said Mark Pommrehn, a computer engineer at Cherne.

Clinical testing so far has backed up Cherne's claim of accurately diagnosing potential heart disease in 85% of those tested, Cuddihy said. The standard stress EKG test has a reputed accuracy rate of about 60%.

Stress tests also produce a high number of "false positives" — wrongly tagging a patient as sick.

Therein lies Cherne's economic lure for insurance companies, for a better diagnostic tool could mean reduction of unnecessary, more expensive testing.

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The above comparative product data is based on industry newsletters, industry analyst information, vendor price lists, vendor advertising material, and other material available as of November 3, 1989.
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NEW PRODUCTS — SOFTWARE

Database management systems

Interbase Software Corp. has released Version 3.0 of the Interbase relational database management system.

The latest configuration was tailored to increase performance in the database kernal with the addition of event alerters, array support, blob filters and user-defined functions. The software runs on platforms from Hewlett-Packard Co., HP's Apollo division, Digital Equipment Corp. and Sun Microsystems, Inc.

Pricing for Interbase Version 3.0 ranges from $5,000 to $100,000, depending on hardware configuration.

Interbase
209 Burlington Ave.
Bedford, Mass. 01730
617-275-3222

Applications packages

McCormack & Dodge Corp. has expanded its human resource product offerings with a module designed to provide integrated benefits administration capabilities.

HR:Millennium Flexible Benefits integrates with the company's existing line of human resource software and is capable of managing several areas, including enrollment, record keeping and administration, the vendor said. The product reportedly allows users to collect, maintain, report and gain on-line access to employee benefits information and to make changes according to corporate or legislative requirements. The software runs on IBM OS/DOS machines and is priced at $35,000.

McCormack & Dodge
1225 Worcester Road
Natick, Mass. 01760
508-655-8200

Unisys Corp. has announced the Standardized Tactical Online Public Safety System for police and fire departments using the AT&T Unix System V minicomputer platform.

Previously available only for the Unisys mainframe environment, the latest release is targeted at small and medium-size county sheriff, police and fire departments that receive between 25,000 and 150,000 calls per year. Computer-aided dispatch, records management and administrative management capabilities are included.

Software license fees range from $16,000 to $65,500, depending on modules purchased.

Unisys
P.O. Box 500
Blue Bell, Pa. 19424
215-542-4213

Landmark Graphics' *software runs on Sun's Sparcstation*

Landmark Graphics Corp. has announced the availability of its 3DPlus and 2DPlus seismic interpretation software packages, which run on the Sun Microsystems, Inc. Sparcstation platform.

Targeted specifically at the computer-aided exploration community, the company's interpretation software systems reportedly are also available for the IBM RT and reduced instruction set computing workstations.

According to the company, retail pricing for the 3DPlus and 2DPlus Sparcstation platform configurations starts at approximately $100,000.

Landmark Graphics
333 Cyprus Run
Houston, Texas 77094
713-579-4700

Utilities

Comtek Services, Inc. has announced a memory management software package developed specifically for use on Stratus Computer, Inc. systems and IBM System 88 computer platform.

Called Shared Virtual Queues, the program's design keeps control information about the system separate from the data buffers, which in turn are organized into several pools, the firm said. Both the size of the buffers and the number contained in each pool are determined by the user when the product is installed.

The software is priced at $5,000 for a single-user license. A multiuser license is available for $50,000.

Comtek
11337 Classical Lane
Silver Spring, Md. 20901
301-681-0825

A program designed to increase batch run times in an IBM Application System/400 environment has been announced by Nevada Computer Technologies.

Called The Performer, the command-driven system provides enhanced processing capabilities for mulitple job queues. Users can cycle job queue priorities to give all queues the opportunity to submit jobs. The software program is also said to prevent monopolization by certain job queues. The product is available now.

Pricing for IBM AS/400 B10 through B70 versions will range from $100 to $700.

Corporate licenses are also available.

Nevada Computer Technologies
P.O. Box 3890
Reno, Nev. 89504
702-358-3033

NEW PRODUCTS — SYSTEMS

Processors

Unisys Corp. has announced a multiprocessor server designed to accommodate up to 128 BTOS/CTOS intelligent workstations and/or AT-compatible personal computers.

The XE-530 is based on the Intel Corp. 80386 microprocessor and can support from one to 30 processors. A base system consists of 4M bytes of error-correcting memory, a 145M-byte hard disk drive, a 150M-byte ¼-in. tape drive and two cluster ports. A base system can support up to 32 workstations. As the user's needs increase, more processors, memory and storage can be added.

Base systems are available for a list price of $27,995.

Unisys
P.O. Box 500
Blue Bell, Pa. 19424
408-434-2848

Concurrent Computer Corp. has announced a numerical processing capability that provides up to 640 million floating-point operations per second.

The CNP-3200 is an auxiliary accelerator for compute-intensive problems that runs in concert with a Concurrent S-bus real-time computer. This includes the Model 3280SP, the 3280MPS or the Micro3200 family. The product is aimed at real-time computing markets, such as oil exploration and signal processing, and is priced from $48,500.

Concurrent
106 Apple St.
Tinton Falls, N.J. 07724
201-758-7000

Data storage

Alphatronix, Inc. has announced a 55-cartridge jukebox for erasable optical discs.

The Inspire jukebox uses the International Standards Organization-standard 5¼-in. cartridges and has a capacity of 35.75G bytes. Discs can be removed from and inserted into the unit via a mail slot or a 16-cartridge job pack.

The jukebox can be used with Digital Equipment Corp. VAX and Microvax computers, as well as Sun Microsystems, Inc., IBM Personal Computer, Apple Computer, Inc. Macintosh and Scitex America Corp. computing platforms.

A standard, DEC-based, 55-cartridge Inspire jukebox includes cartridge changing robotics, two erasable drives, a Q-bus or Unibus interface card, cables, data management software, operator utility programs, software for automatic loading and mounting of volumes and a backup utility. The price for this system is $74,900.

Alphatronix
P.O. Box 13687
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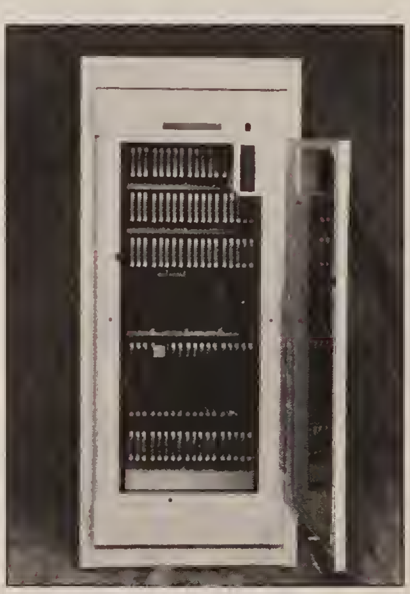
Research Triangle Park, N.C. 27709
919-544-0001



Exabyte's EXB-120 *is suited for large systems*

Exabyte Corp. has introduced the EXB-120 CHS robotic cartridge handling system.

The modular unit provides more than half a terabyte of unattended tape storage and is especially suited for large systems, network backup and storing image and business records. Designed to utilize the EXB-8200 and EXB-8500 cartridge tape subsystems, the system includes a key lock for data security and is mountable in a 19-in. rack. Production shipments are scheduled for the third quarter of 1990.

Single-quantity pricing for OEMs and systems integrators is $35,000.

Exabyte
1745 38th St.
Boulder, Colo. 80301
303-442-4333

Digital Equipment Corp. has announced the availability of increased disk storage capacity for its Microvax 3300, 3400 and 3800 systems.

Purchasers will have the option of specifying up to 7.2G bytes of disk storage on the 3800 and 3400 systems and 6.3G bytes on the 3300 system.

Previously, users could obtain 2.4G bytes of storage on Microvax Models 3800 and 3400 as well as 1.5G bytes on the Model 3300.

DEC
146 Main St.
Maynard, Mass. 01754
508-493-6647

I/O devices

A four-session midrange system terminal designed for users of IBM's Application System/400 and System/34, 36 and 38 computers has been announced by Ideassociates, Inc. The Idea 177 emulates IBM's 3196, 3197 and 3180 system terminals. Users may run four applications simultaneously, two of which can be configured as host-addressable printer sessions. The product provides serial and parallel ports and is available in monochrome (green or amber) or color versions. Both 80- and 132-column support is offered in both full- and split-screen mode, according to the vendor.

The monochrome unit has a suggested retail price of $1,395. The color model is priced at $1,595.

Ideassociates
29 Dunham Road
Billerica, Mass. 01821
508-663-6878

Power supplies

Alpha Technologies, Inc. has unveiled an uninterruptible power supply for minicomputer-based operations. These include IBM System/36, Application System/400 and Digital Equipment Corp. VAX systems.

The Alpha 5000 was designed to protect minicomputers from power outages, surges and spikes. The unit supports Novell, Inc. SFT Netware 2.12 and higher and Best Power Technology, Inc.'s Powerwatch software.

The unit's functions can be controlled through an RS-232 port or via an optional status-monitoring panel. Battery recharge time ranges from three to seven hours depending on the batteries chosen.

The Alpha 5000 with a standard battery pack costs $6,966.

Alpha Technologies
3767 Alpha Way
Bellingham, Wash. 98226
206-647-2360

PCs & WORKSTATIONS

MICRO BITS

Patricia Keefe

Lotus sets '90 agenda

It's credibility time for Lotus, and don't they know it! The spreadsheet mavens have slated three briefings this month to bring the industry up to date on its product rollout plans and corporate strategy up through the first half of 1990.

Most prominent on the Lotus agenda is mopping up after the May 1987 product promises. After that, Lotus intends to launch full steam ahead into the database market and overhaul its service, support and distribution programs.

1988 and early 1989 were tough, with missed ship dates and departing executives, but Lotus is doing well these days, thanks in part to the long-awaited delivery of 1-2-3 Release 3.0 on June 20. And the company is not about to rest on

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Inside

- Slowly but surely, Pacific Bell interfaces with the future. Page 37.
- High-tech cost justification: A study in frustration. Page 37.

DCA seeks to dodge IBM shift

Time will tell if jabs at OS/2 Extended spell success for Select Server

ANALYSIS

BY PATRICIA KEEFE
CW STAFF

Digital Communications Associates, Inc. (DCA) is backed into a pretty tight spot at the moment. And even more uncertain than the fate of the overall company, ever the center of buyout rumors, is the future of its still undelivered Select Communications Server.

The fact that DCA sold off its T1 and multiplexing divisions last quarter in order to concentrate on its personal computer-based connectivity products underscores the importance of the success of its OS/2 server.

Yet without having seen the light of day, the Select Server — DCA and Microsoft Corp.'s alternative to the IBM OS/2 Extended Edition's Communications Manager — has already hit a few bumps.

First, after buying Fox Research, Inc. and renaming it 10-Net, DCA decided to build Select Server as an Extended Edition alternative. But the project faltered until, out of the blue, it was rescued and revamped with aid from new partner and industry heavyweight Microsoft.

The Select Communications Server, coupled with a stake in Sybase, Inc.'s SQL Server, would have enabled Microsoft to offer its OEMs an alternative to IBM's Extended Edition. The revised ship date became first-quarter 1990.

But in November, a mere quarter away from availability, Select Server's raison d'etre appeared to be blown away. At that time, IBM announced plans to unbundle Extended Edition, which will be made available to third parties, possibly using Microsoft as the conduit. This means that users and competitors do not have to settle for an alternative.

Some might perceive this as a crushing blow. But not DCA, which appears at times to have more lives than a cat. Publicly, at least, it is convinced it can bounce back.

Analysts who met with DCA last week said Select Server's ship date has been moved to second quarter. Mary McCaffery, an analyst at C. J. Lawrence in New York, said DCA told her that the product has gone through a lot of changes.

A DCA spokesman said DCA wants to have time to test its OS/2 Systems Network Architecture (SNA) server against a

Continued on page 44

Select reasoning

The checklist below, courtesy of DCA, lists a few "reasons" users might want to consider DCA's Select product line:

- You are considering IBM's Systems Application Architecture but want multiple vendor options.
- You are considering LU6.2 but have coaxial cable links.
- You want peer connectivity without host involvement.
- You have Ethernet and want to use Token-Ring local-area networks to connect to the mainframe.
- You want a variety of ways to connect to your host(s).
- You have a mixed environment of desktop computers, operating systems and processors.
- You want to move to OS/2 in a controlled manner, connecting DOS and OS/2 workstations to an OS/2 server.
- Host access is so important that if a server goes down, users must be routed automatically to an alternative server.

Autocad gears up for 386 action

BY RICHARD PASTORE
CW STAFF

SAUSALITO, Calif. — As Intel Corp. 80386-based technology solidifies as a desktop computing standard, vendors are overhauling older programs in order to partake of its superior processing prowess.

For example, Autodesk, Inc. recently announced shipment of a version of its Autocad computer-aided design (CAD) package that is designed for 386-based computers running extended DOS.

Citing a series of CAD benchmarks, the company said that its new software works between 30% and 62% faster on 386 machines running extended DOS than it does on Intel 80286-based personal computers running standard DOS.

Autodesk combined its CAD package with DOS extender technology from Phar Lap Software, Inc. to allow access to extended memory of up to 4G bytes.

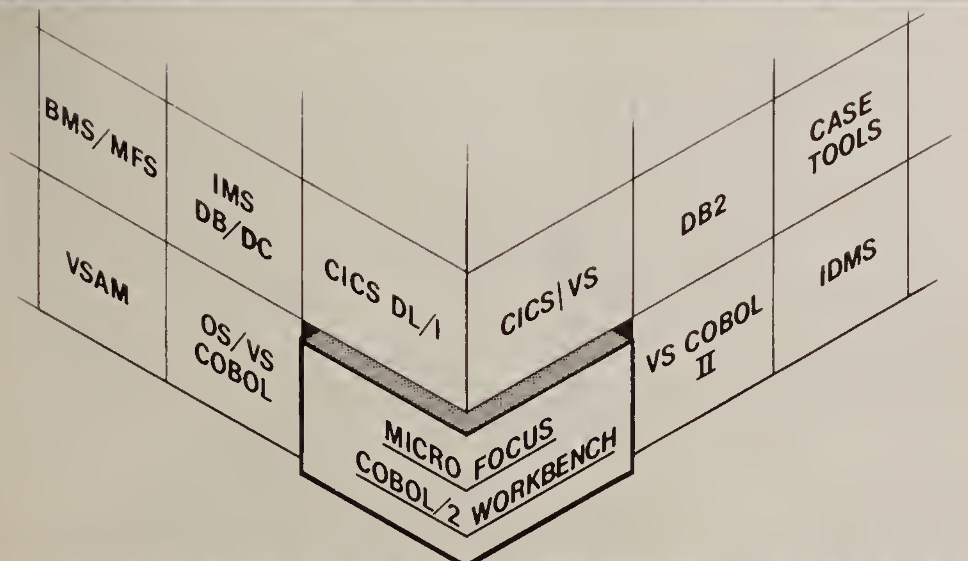
Geared to large drawings

"The performance increase allows Autocad users to work more effectively with the large and complex drawings that are increasingly common in today's CAD applications," according to Autocad product manager John Forbes.

Other enhancements built into the release include a menu-driven installation program that improves the speed and ease of installation, according to the company.

Current Autocad users can upgrade to Autocad 386 for $300. It will cost new users $3,300.

Mainframe technology, but PC productivity. Now!



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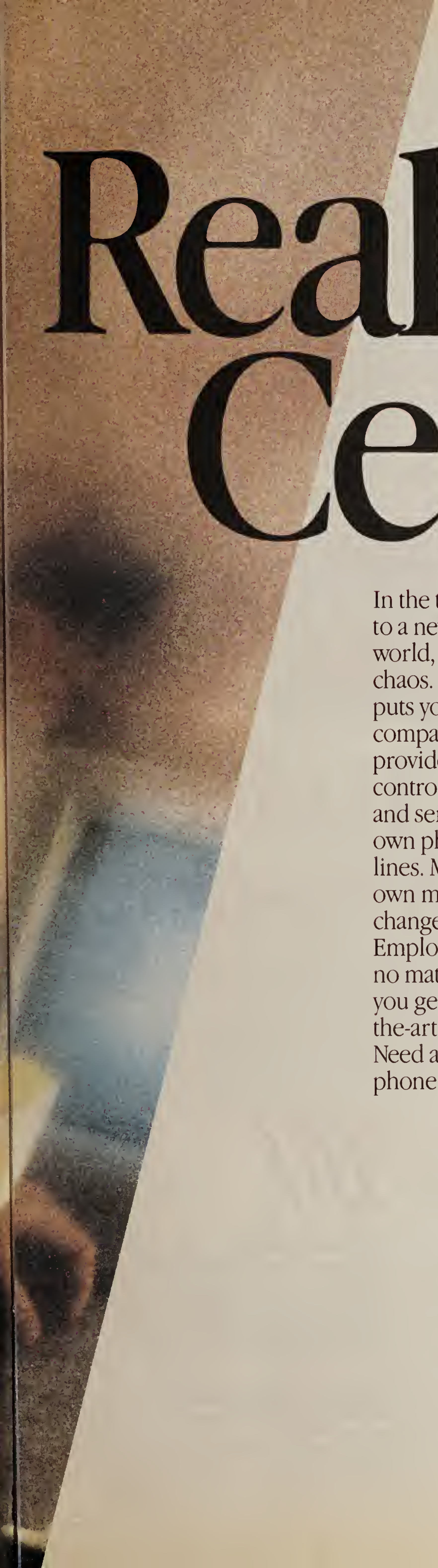

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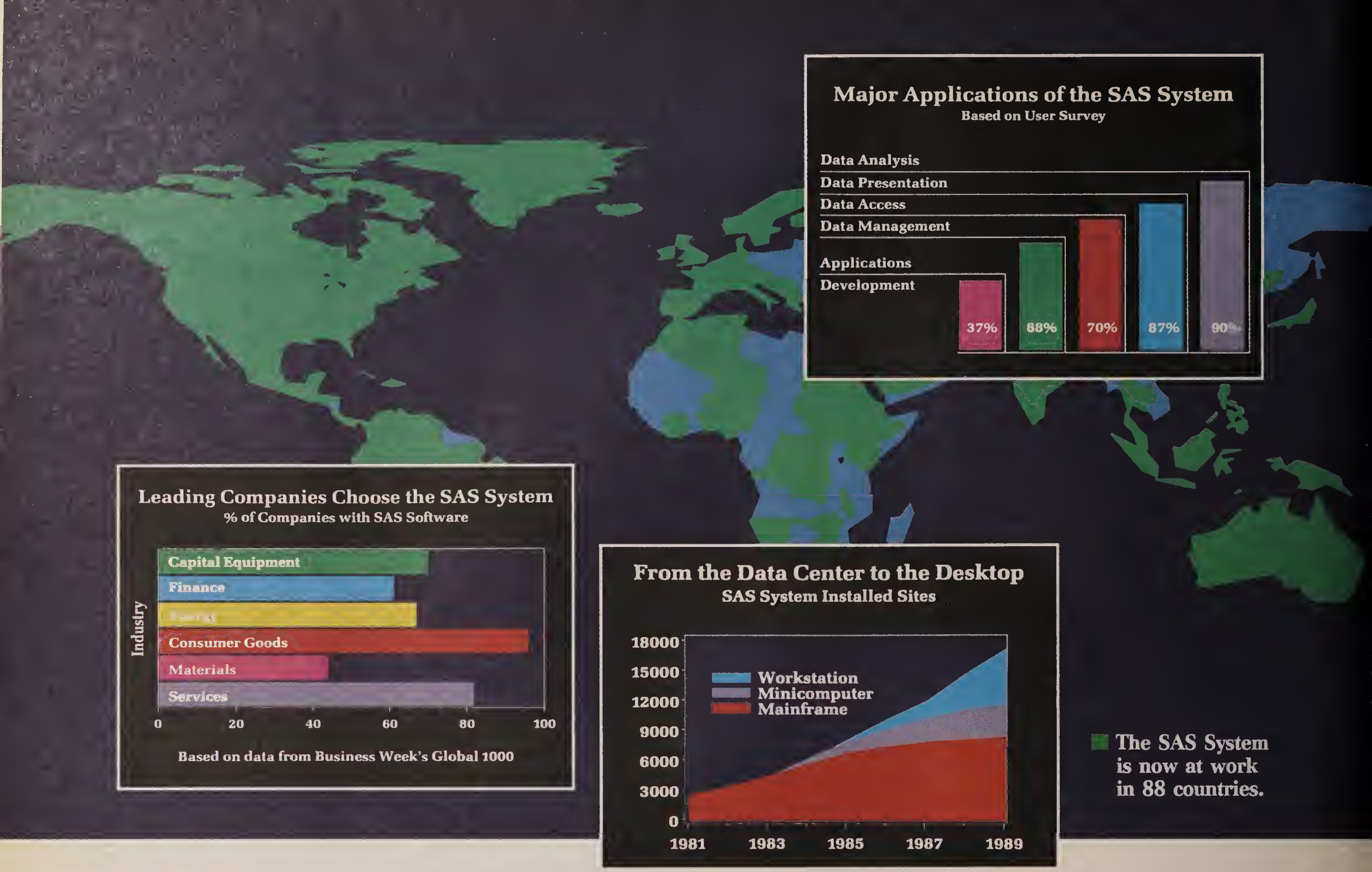

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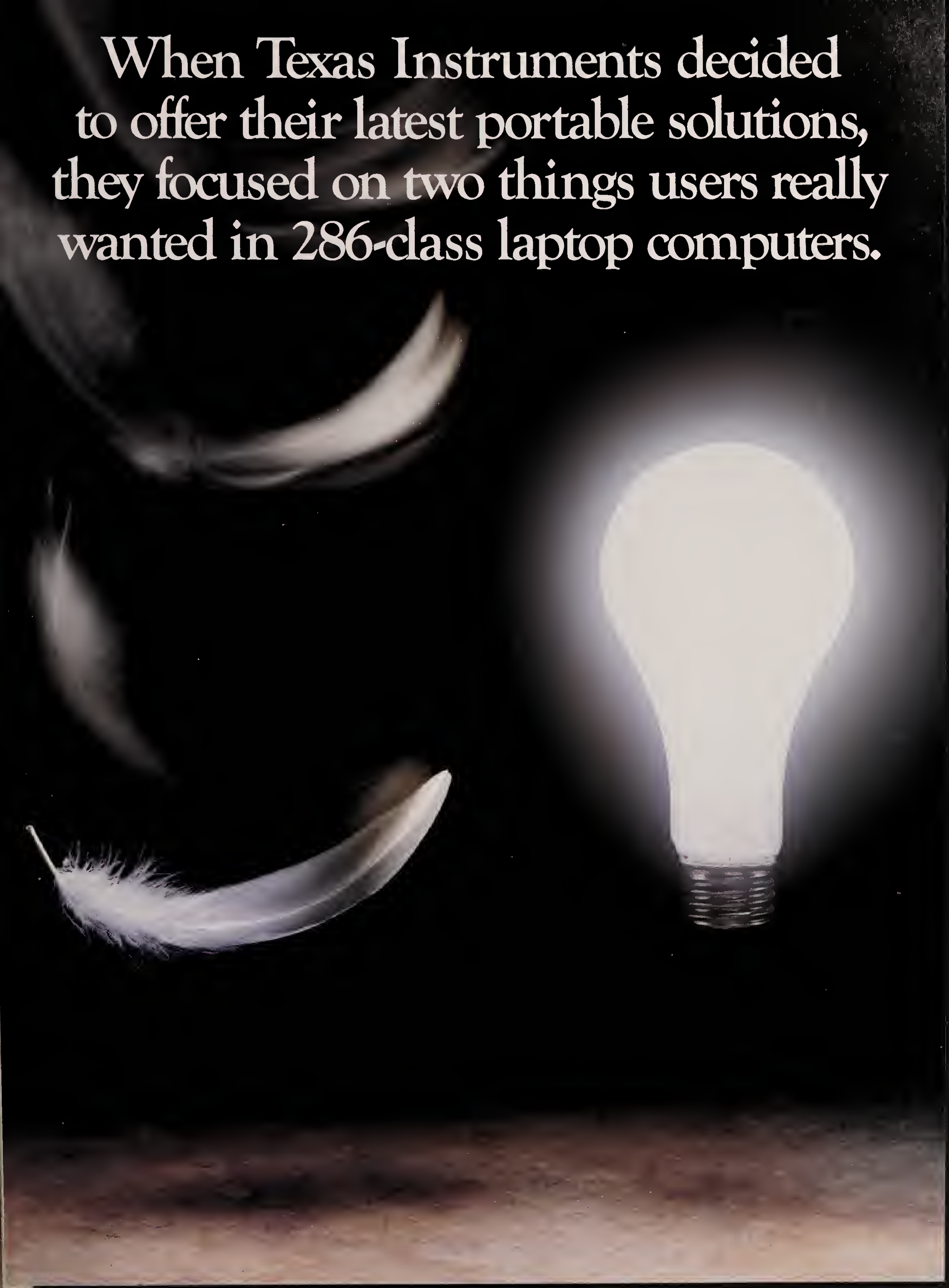
When Texas Instruments decided to offer their latest portable solutions, they focused on two things users really wanted in 286-class laptop computers.



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Full-function AT®compatibility, featuring two of

Model 12: All the power — half the weight.

Weighing a remarkable 6.7 lbs. — including battery and 20 MB hard disk drive — TI's TravelMate LT286 Model 12 delivers all the processing power of a desktop PC in a laptop. It's the perfect choice for professionals who need to work on-the-go.

Getting started couldn't be easier. That's because the Model 12 has MS-DOS 3.3® and LAP-LINK™ in ROM. It also comes with a preformatted disk drive, making it ready to use right out of the box.

With the Model 12, you don't sacrifice performance for small size and weight. Business software runs fast, thanks to a 12 MHz 80286 microprocessor. There's plenty of storage for all kinds of software applications — the internal hard disk drive comes standard. Plus, you get 1 MB of RAM, expandable to 4 MB.

Not only does the Model 12 perform like a desktop PC, it has the same touch. The AT-style keyboard provides full-size, full-travel keys that give your fingers plenty of room.

Other features include an easy-to-read, enhanced Supertwist backlit LCD screen. A removable 3.5″ high-density diskette drive provides additional flexibility and convenience — snap it on for loading software or remove it and travel light. And, sending critical work to your office takes only a phone call with an internal modem.

The TravelMate LT286 Model 12: the laptop that doesn't compromise performance for size.

The removable 3.5″ high-density diskette drive and internal modem are optional.

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If you want portability and an exceptional display for graphics, you'll appreciate the bright side of this solution. TravelMate LT286 Models 25 and 45 feature a brilliant black-on-white VGA display that rivals that of most desktop PCs.

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Not only do you get a superb display, you get superb performance as well. Like standard AT-compatible desktop PCs, Models 25 and 45 operate with a 12 MHz 80286 microprocessor for quick and powerful processing. You also get a 20 MB or 40 MB internal hard disk drive; an internal 3.5″ diskette drive; 640K of RAM, expandable to 3.64 MB; an AT-style keyboard with full-size, full-travel keys; and an internal battery.

In addition, an intelligent power management system turns off the screen and fixed disk drive during periods of inactivity to extend battery life, allowing you to use the laptop longer.

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Two decades of portable solutions add up to lighter, brighter solutions.

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DTI03

SMALL TALK

James Daly

Apples are for grown-ups

It used to be that Apple Computer was the cuddly koala bear of the computer industry. It threw elaborate parties at Disneyland, made it hip to know how to hotwire a circuit board and crowned its sloppy genius with the Macintosh — an intuitively simple personal computer that forever buried the notion that computers are about as friendly as a pit of vipers. Along the way, they bred a user fanaticism that was unheard of outside of Harley-Davidson owners.

But all that seems to be changing. The 1990s promise to represent a clear line of demarcation for Apple as it moves away from the entry-level users that it once counted as its main customers.

The company that was once laughed out of the boardroom is working overtime to establish itself in the offices of corporate America, pushing high-end machines at high-end prices. Apple's original premise of creating "the computer for the rest of us" suddenly seems more stale than yesterday's doughnuts.

Financially speaking, it's hard to needle Apple for going corporate. Tools like the Macintosh IICI, a high-powered PC that competes squarely against low-end workstations, along with a new suite of networking products and a revamped version of its A/UX version of Unix have helped make Apple a viable IBM alternative, as well as a $5 billion company.

But it's distressing to see the low end slip away. Although President John Sculley has said that he intends to pay more attention to less expensive machines, some are beginning to question his commitment to this goal.

Take Apple's upcoming system software, for instance. System 7.0 promises to be the biggest rewrite ever of the Macintosh operating system. Trouble is, it will need at least 2M bytes of random-access memory. Unless they upgrade their machines, this will leave out the majority of Mac users.

Some entry-level products are planned, but they may not go far enough. A replacement for the Mac Plus and SE is expected by September, but a low-priced machine capable of displaying

Continued on page 44

Pac Bell hitches itself to Starlink

ON SITE

BY CHARLES VON SIMSON
CW STAFF

SAN RAMON, Calif. — In the race to the future, Michael Evans is definitely the tortoise, but he is convinced that a slow and steady solution will get Pacific Bell over the finish line first.

Evans is the technical director of the user interface development group in the customer service automation project at Pacific Bell, the California telephone operating company. His task for the past four years has been to develop a generic windows-based interface on a personal computer platform, internally named Starlink. The system is designed to give customer support people menu-driven access to the firm's far-flung mainframe and minicomputer-based databases.

The rub is that when development began as part of an overall Pacific Bell project to automate customer service, Evans felt that commercial graphical user interface products were not yet viable alternatives.

Integrating corporate information required support for a number of disparate protocols and demanded simultaneous Digital Equipment Corp. VT100 and IBM 3270 terminal emulation, capabilities that are not yet available in a single commercial offering. In addition, Evans and others at Pacific Bell contend that bit-mapped graphical interfaces are too expensive and indeed outstrip the needs of ordinary data-processing users.

The solution at Pacific Bell is a character-based window system that integrates multiple applications and data sources on a menu-driven screen. About 8,000 customer service personnel use the system, which has been rolling out in stages over the past two years.

"A lot of people would probably like to have a true bit-mapped graphical user interface," Evans said. "But for now, those interfaces have left behind the standard data-processing organization. They are simply more than most organizations can digest in terms of both finances and corporatewide connectivity."

The maturity of commercial windows products has come only since the project began. "Our philosophy as a company is to buy rather than build," said Jack Hancock, MIS director at Pacific Bell. "When it is time to replace this product in five to seven years, we will definitely look for a commercial alternative, but when we started, the only way to get what we needed was to build it ourselves."

From dumb to smart

Outside of customer service areas, most order-entry and other data-entry people are using dumb terminals. Pacific Bell IS does support about 3,000 professional workstations, some of which run more advanced systems such as Lotus Development Corp.'s 1-2-3 and Microsoft Corp.'s Windows.

Prior to the installation of Starlink, customer service people used a character and hot-key system to toggle between applications on dumb terminals. With the service automation project, the need for an advanced interface integrating different applications required a PC platform. Thus the company shifted to PCs to support the interface.

The labor and error savings alone enabled by the new Intel Corp. 80286 PC-based system are impressive. Data-entry errors have been reduced by 15%, largely a function of the fact that the average transaction requires about 700 fewer keystrokes. In addition, each transition between databases took between 10 and 18 seconds, which has now been reduced to an average subsecond response time.

"Each one of the fewer keystrokes, and subsequent errors, translates into a direct bottom-line savings, as well as a boost to service," said Pat Decker, director of the overall customer service automation project that originally funded Starlink.

With the first phase of the project nearing completion, the firm ultimately hopes to incorporate a cooperative processing capability in the access and dissemination of network database information. The Pacific Bell flavor of cooperative processing is the complete independence of the interface and processing layers of an application: Although part of a transaction is processed locally on the PC and another part on a remote host system, the interface is transportable throughout the company.

TIM DAVIS

Pacific Bell's *Evans helped create the windows-based Starlink*

That goal has come somewhat nearer with a pilot project that allows customer service representatives to schedule service calls on business customers for certain times of the day rather than just morning, afternoon or full-day assignments.

The system allows the representative to input a time and location at the PC level. The system then queries manpower availability and service van routing databases to see if the specified time is possible. If not, the PC interface will not let the representative input the selection.

Starlink was written in standard C over a homegrown multithread layer that allows for multitasking at the interface level.

Efforts to cost-justify technology leave users cold

BY CHARLES VON SIMSON
CW STAFF

SUNNYVALE, Calif. — Caught in the increasing pressure on IS organizations to cost-justify technology acquisitions, vendors have scrambled in recent months to put together cost justifications for the wares they are peddling. But even among satisfied customers, there is a strong distrust of the numbers vendors are pitching with ever increasing frequency.

Within the last six months, Businessland, Inc. promised it would invent a productivity measurement for white-collar workers, a task that has eluded a generation of business school researchers. A Businessland spokesman said that the metric is still under development, and no specific delivery date is currently available.

Infonetics, a San Jose, Calif., research firm, produced a study showing the cost of down personal computer-based local-area networks. In announcing the study, the firm conceded that most productivity numbers, including its own, are built on shaky estimates of the value of professional workers' time and the impact of technology on their productivity.

Continuing with this trend, Metaphor Computer Systems recently released a study claiming that its data interpretation systems contribute in quantifiable measure to the profitability of its customers' businesses.

The study, conducted by Business Science International (BSI), claims that in a survey of nine major companies, such interpretation systems accounted for an average $8.7 million in profit. The profit, according to the study, came from faster interpretation of market and other types of data.

Taken with a grain of salt

Metaphor would not release the names of the surveyed customers, but while Fortune 500 users contacted by *Computerworld* find Metaphor's systems useful, few found the study's cost numbers compelling.

"It is a lot like saying 'I can save money by running next to the bus, but I can save more money by running next to a taxi,' " said Paul Fink, staff manager in the consumer services marketing division at AT&T in Paramus, N.J.

Fink's division uses the Metaphor system to interpret account and demographic data to fine-tune AT&T consumer marketing efforts. "It is useful in that it does help us make more timely decisions," Fink said, "but I couldn't point to any specific cost benefits. Vendors are simply getting hit with the same stick as all IS professionals: the need to cost-justify systems. But their numbers are simply too soft."

According to the Metaphor study, Fortune 500 customers surveyed said that data interpretation systems currently return $3 in profit for every dollar invested and that ultimate annual profit-to-cost payback will exceed $15 for every dollar spent.

A BSI researcher involved in developing the study said that the ability to complete such tasks as tracking the success of a specific coupon promotion in a retail sales environment had a bottom-line impact.

The researcher declined, however, to make the direct link between systems and a specific cost measure. "An increase of 1% in sales as a result of a coupon promotion on a $12 billion product line is significant," he said. "Metaphor allows that kind of data interpretation." But he could get no closer to the specific value of the system in the increased sales equation.

Compared to HP's NewWave Office, IBM's

OfficeVision has a few limitations.

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To date, sixty companies are writing software for HP NewWave Office. According to IBM's advertising, eight are writing applications for IBM OfficeVision. So, which system gives your people a greater selection of software?

Beyond all this, HP NewWave Office system gives your users the extraordinary new "agents" capability. Like a computerized staff, "agents" can learn to handle a wide range of sophisticated computing tasks, such as compiling and distributing sales forecasts. IBM OfficeVision has nothing comparable. So, which system is actually more visionary? To find out, call **1-800-752-0900**, Ext. **283G.**

There is a better way.

HEWLETT PACKARD

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Keefe

CONTINUED FROM PAGE 33

any laurels. For one thing, it has *got* to ship four new versions of 1-2-3 or risk the wrath of Wall Street and impatient customers. At last Monday's briefing, Lotus President Jim Manzi pretty much confirmed shipments within six months.

But generally speaking, micro sales have been slowing, and most analysts and, indeed, many vendors are being cautious about 1989 sales.

This fall, Lotus and some other software developers expressed concern over what they perceive as one cause for the slowdown — confusion about which operating system or environment to support.

But instead of renewing its civil war with Microsoft, Lotus is divorcing itself from the environment battle. Rather than risk snubbing one platform to develop for another, a la Windows, the spreadsheet kingpin has zeroed in on the ones it believes will be key in the 1990s.

But I don't think users are that confused. Rather, they are not about to part with their dollars until they find a need for all this spanking new technology that has been raining down upon them. Over and over, I have heard users doubt the value or need for some of the new technology. Most users will tell you they are committed to OS/2, but they'll also tell you that's part of a future strategy.

In short, there is a wide-open gulf in the PC software industry, between what vendors are touting and what customers either want or, more likely, can use today. Monday's briefing indicated that Lotus recognizes this. Manzi refreshingly observed that vendors are now 12 to 24 months ahead of customers, who may take until early 1991 to place their bets.

Consequently, you're going to see a shift in vendor stress from new technologies to more nitty-gritty issues such as interoperability and service, service, service. This will help vendors bide their time until users decide to make a move.

With that in mind, the real news from last Monday's briefing has to do with a strong emphasis on database market opportunities and recognition that host-based versions of 1-2-3 will require better support and more direct sales.

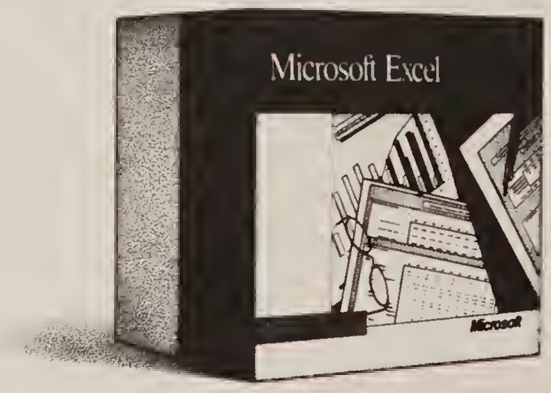
Lotus smells blood in the database waters. Manzi and Senior Vice-President of Software Development Frank King perceive a gaping void in the database market, thanks to Ashton-Tate's mounting woes. Ed Esber's East Coast rival is determined to go full force into the potentially lucrative database market. More details will be forthcoming.

Manzi also revealed a new emphasis on service and support. As it gets harder to differentiate products, Lotus will be looking to support issues to boost its value-added services.

The demands of host-based versions of 1-2-3, never mind data access security issues, require increased service and support. Manzi indicated Lotus is unwilling to rely upon traditional channels to meet these needs. He hinted strongly that efforts to improve support may boost the cost. For example, Lotus is considering a 900 number for telephone support.

Keefe is *Computerworld's* senior editor, PCs and workstations.

Stop your soul searching.



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MICRO NOTES

Blue Cross garners praise

Blue Cross and Blue Shield of Virginia was lauded recently for its computer-assisted training program for its new claims-processing system. Developed with assistance from Andersen Consulting, the program was cited by the Interactive Video Industry Association for using interactive technology to achieve measurable improvements in learning.

North American retail software sales for the third quarter were up 10% over the same period a year ago, an increase estimated at $780 million, according to **The Software Publishers Association.** International sales of U.S. software firms grew 25% over the same period. The combined growth rate for sales here and abroad was 16%. The largest ($163 million) and fastest growing category (up 39%) was spreadsheets.

The **Video Electronics Standards Association** (VESA) has adopted and published a new standard for Super Video Graphics Array (VGA) BIOS Extensions. The adopted standard (VS891001) documents a common software interface to Super VGA video adapters to simplify access to extended video modes such as 640 by 480 256-color mode. The standard follows the 800 by 600 16-color mode standardized by VESA in April 1989 and four 8 514/A standards approved in August 1989.

Micro Focus, Inc. has announced that **IBM** is offering a version of Micro Focus Cobol/2 for IBM's AIX Personal System/2. The new version is called AIX PS/2 VS Cobol.

Mapinfo Corp. has said it will donate 1,400 copies — $1 million worth — of its desktop mapping software, Mapinfo, to fully accredited colleges and universities. Qualifying schools must use the package as part of an ongoing curriculum and must have a plan in place to deal with general data security. Call Debra Perkins at 1-800-327-8627 for an application.

"Today's application backlog is such a nightmare, it'll take more resources to fix it than even IBM has."

–a software developer

"You're right."

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for creating
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applications.

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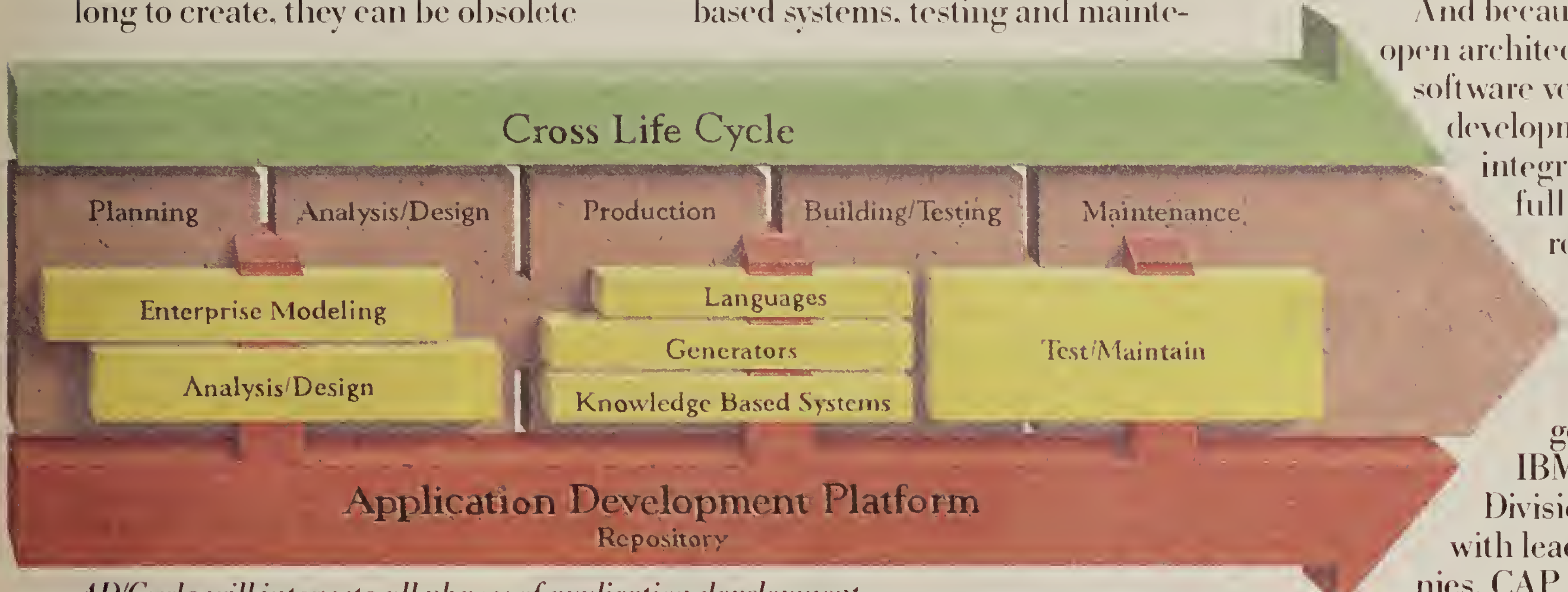
With computers humming along at 100 million instructions a second, it seems insane, but it's true:

Programmers are averaging about 10 lines of code a day, and applications are backed up 2 to 3 years.

Worse, applications now take so long to create, they can be obsolete before they're finished. And when they are finished, they require so much maintenance, many programmers don't have time to write anything new.



AD/Cycle will integrate all phases of application development.

It's a bigger problem than IBM, or anyone else, can handle alone. So our solution, AD/Cycle, teams IBM with some special IBM business partners.

And because you can't wait, many AD/Cycle products are available now.

But before getting into who's offering what, let's look at what AD/Cycle is, and why it is *the* development solution for the '90s.

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To begin with, AD/Cycle is a framework that gives the entire development cycle something it never had before: a consistent set of standards. Within it, all phases of the process (see diagram) can be coordinated.

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And, because a real obstacle to getting applications done right is getting people to communicate, AD/Cycle also offers a repository for sharing information: details about a company's structure and methods, expressed in a uniform way, to keep executives and programmers on the same wavelength.

Thanks to SAA,™ these pieces not only will fit together but can produce code for multiple IBM operating systems. And you can use as many, or few, AD/Cycle tools as you need.

The Right Tools.

AD/Cycle has too many tools to describe them all, but here are some highlights.

Along with products from IBM, key elements of AD/Cycle are coming from BACHMAN Information Systems, Inc., Index Technology Corporation and KnowledgeWare, Inc.™

Each is a leader in CASE technology, with products that reduce years to months, and months to days.

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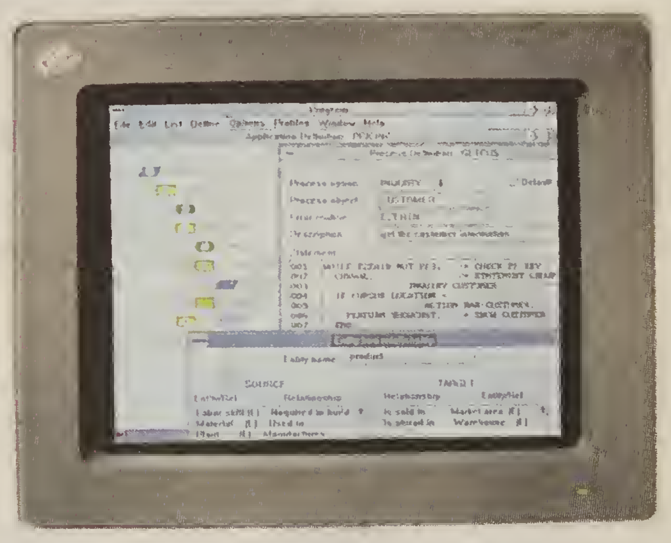
And because AD/Cycle is an open architecture, many other software vendors are creating development tools that will integrate with it, taking full advantage of IBM's repository manager.

Right Now.

To help you get going with AD/Cycle, IBM's Systems Integration Division is joining forces with leading service companies. CAP Gemini America, Computer Power Group, Computer Task Group and GE Consulting will be working with us to assist you in planning, training and implementation.

OS/2 EE versions of AD/Cycle tools will arrive through 1990, but you don't have to wait to get started. Many tools are available now, and with excellent track records.



All AD/Cycle products will have the easy-to-use, SAA graphical interface.

Response to AD/Cycle, from both vendors and users, has been overwhelmingly positive. Clearly, it represents the future of application development.

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DCA

FROM PAGE 33

commercial version of the latest release of LAN Manager (2.0), which is slated to ship this quarter. "This is not good, they were supposed to deliver a year ago," said Lee Doyle, an analyst at International Data Corp.

Yet DCA's Bernd Harzog, senior product manager of LAN communications, is convinced that he can win users over by targeting what he claims are serious flaws in IBM's offering.

Basically, DCA's position is that Select Server provides more timely and cost-effective communication by providing better peer connectivity and tools to manage the various parts of the LANs, Harzog said.

In a very technical white paper released at Comdex/Fall in November, DCA outlined areas where it said Select Server provides more direct connectivity than Extended Edition. Doyle said that white papers are no substitute for shipping product. Still, he said, Communications Manager was "not the most elegant package ever designed."

Among the advantages claimed by DCA's white paper are the following:

- DCA claimed its client/server approach puts the SNA protocol stack on the server. Conversely, it claimed IBM's gateway distributes communications functions to the workstation.
- Select Server reportedly allows peer sessions on different LANs to interact without mainframe intervention. Extended Edition's gateway lacks peer SNA support, requiring host intervention.
- Select Server will provide multiuser configuration and management tools to allow centralized control of all servers and users from any OS/2 PC. Extended Edition is said to force users to configure and manage each PC separately.
- DCA said it will allow users to consolidate all LAN-to-host activity on a single server. Extended Edition supports only one host connection per gateway.

Harzog has a persuasive argument. However, a lot will rest on *when* DCA ships, how involved Microsoft becomes in the IBM unbundling scheme, and what, if any, changes IBM makes in Communications Manager.

Daly

FROM PAGE 37

color images probably won't make it to the stores in time for next Christmas.

Additionally, Apple's low end may be too pricey to remain truly competitive. An SE with a monochrome monitor costs $2,000 or more. IBM clones are cheaper, even with color monitors.

Apple's original argument that it could charge more because its machines are easy to use can no longer hold water. An IBM clone with Microsoft's Windows or IBM's Presentation Manager is just as simple to use.

This lack of a strong entry-level Mac also threatens to erode Apple's lead in selling to schools — one of its strongest areas and a breeding ground for future users. The darling of the classroom, the Apple II, is now 13 years old and ready for retirement.

The bottom line is that Apple could lose its grip on the corporate user as well as the corporate buyer of the future, which has been a key to Apple strategy for so many years.

In the short term, revenue for its first fiscal quarter promises to slip. The long-term result may be that the current commitment to the corporate world means sacrificing the young user base of tomorrow.

But it's a trend we're clearly going to have to live with. Apple says more than 60% of its Macs now head for the offices of the U.S. government and large corporations. Conversely, sales to the home market have dropped from 33% to 15%.

While Apple moves toward the corporation, the rest of us are discovering what 13-year-olds have known all along: After a certain age, Disneyland just loses its charm.

Daly is a *Computerworld* West Coast senior correspondent.

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NEW PRODUCTS

Systems

A 25-MHz, zero-wait-state, Intel Corp. 80386-based system has been unveiled by Premier Innovations, Inc.

Standard features in the Premier Model 8000 include 1M byte of random-access memory (RAM) that is expandable to 4M bytes, 64K-byte cache memory, a 1.2M-byte floppy disk, shadow RAM and an enhanced small device interface dual hard drive/dual floppy controller.

Pricing for the Premier Model 8000 starts at under $5,000.

Premier Innovations
10310 Harwin Drive
Houston, Texas 77036
713-995-4433

A portable computer based on the Intel Corp. 80486 microprocessor has been introduced by Dolch Computer Systems.

The 25-MHz Dolch-P.A.C. 486-25 weighs under 20 pounds and offers an IBM Video Graphics Array-compatible plasma display option.

The base price for a standard configuration, which includes 2M bytes of random-access memory and a 100M-byte high-speed hard disk, is $12,995.

Dolch Computer
2029 O'Toole Ave.
San Jose, Calif. 95131
408-435-1881

Wang Laboratories, Inc. has introduced a 25-MHz, Intel Corp. 80386-based machine.

According to the vendor, the PC 380/25C can be used as a local-area network server or as an entry-level technical workstation.

A base unit includes 1M byte of memory, a keyboard, a disk controller and either a 1.2M-byte or 1.44M-byte disk drive.

The system is priced at $5,795.

Wang
1 Industrial Ave.
Lowell, Mass. 01851
508-459-5000

Software applications packages

Formworx Corp. has announced a forms-processing system designed to run under Microsoft Corp.'s Windows.

Formworx System 2 includes a what-you-see-is-what-you-get display, on-screen forms fill-in and 500 ready-to-use forms. The package is also compatible with Ashton-Tate Corp.'s Dbase.

The company states that Formworx requires Windows/286 or Windows/386 and is available for $299.

Formworx
Reservoir Place
1601 Trapelo Road
Waltham, Mass. 02154
617-890-4499

Strategic Software Planning Corp. has announced a new local-area network-compatible project management system.

Promislan offers multi-user access to projects, has file and record locking and allows for read-only and read/write access.

Promislan runs on Novell, Inc. and compatible networks and is priced at $6,000 for a server license and $1,800 per node.

Strategic Software
One Athenaeum St.
Cambridge, Mass. 02142
617-577-8800

Effective Data Solutions has announced a function library and data file for use with Nantucket Corp.'s Clipper compiler.

According to the company, Zip/Clip contains a database of over 49,000 records, including ZIP codes and associated city names, counties, states, telephone area codes, time zones, latitude/longitudes and mileage grid coordinates. The program is especially suited for address processing functions and requires less than 1M byte of storage.

The Zip/Clip program costs $175, and data file updates are available on a quarterly basis.

Effective Data Solutions
28225 Agoura Road
Agoura Hills, Calif. 91301
800-777-8818

Software utilities

NEC Home Electronics, Inc. has announced four compact disc/read-only memory desktop publishing products.

According to the company, the software will provide users with high-quality typefaces, photos and professional art for import into other applications.

Four disks are available: Type Gallery PS, Type Gallery LJ, Image Gallery and Photo Gallery.

The Type Gallery PS disk contains all 470 typefaces in the Adobe Systems, Inc. Postscript library and is priced at $9,999.

Type Gallery LJ includes 76 Agfa Compugraphic Type Director typefaces for laser printers and compatibles. Users purchase the disk and have the desired typefaces made available via a NEC-supplied code.

The disk and three typeface families are available for $299. Additional families can be purchased for $185 each.

Image Gallery provides users with a library of nearly 3,000 hand-drawn images in 20 categories. Purchasers can have

Continued on page 46

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F1

Continued from page 45

groups made available through the same coding technique as Type Gallery LJ. The disk, with six categories available for use, lists for $399. Additional categories can be accessed for $99 each.

Photo Gallery contains more than 1,500 black-and-white photo images that can be imported to any application that uses Tagged Image File Format. The disk is priced at $399.

NEC
1255 Michael Drive
Wood Dale, Ill. 60191
312-860-9500

A file and directory manager for both networked and stand-alone IBM-compatible personal computers has been announced by Elvish Consulting.

Elftree 2.0 offers an enhanced user interface and an editor that permits a user to work on as many as 50 files simultaneously, the company said. The software also has simplified hard disk management facilities and is capable of handling up to 2,500 files per directory and 2,000 directories per disk.

It is priced at $99.95.

Elvish Consulting
1408 Noble Ave.
Springfield, Ill. 62704
217-698-8600

A menu-driven, maintenance scheduling software package that handles up to 25 items is now available from Tronomed, Inc.

Designated the QT-25, the program runs on any IBM Personal Computer or compatible equipped with a hard disk drive.

The package is priced at $99, which includes a disk-formatted instruction manual.

Tronomed
c/o ABC, Dept. A302
Box 66
Del Mar, Calif. 92014
800-642-1144

Macintosh products

Radius, Inc. has announced a graphics engine for the Apple Computer, Inc. family of Macintosh II computers.

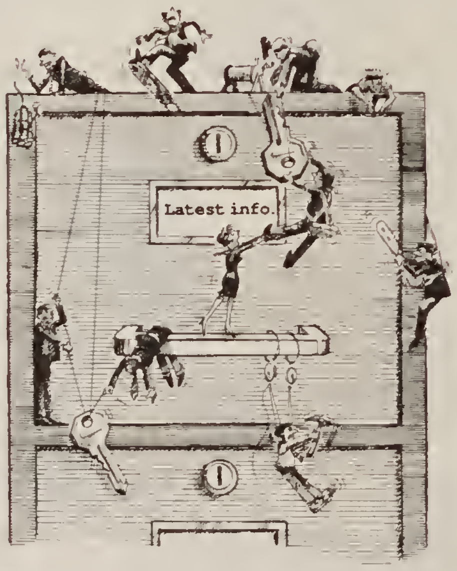
Radius Quickcad utilizes a six million instructions per second reduced instruction set computing graphics engine. This is coupled with proprietary display-list processing software to accelerate Macintosh computer-aided design and engineering application commands.

The product lists for $1,495.

Radius
1710 Fortune Drive
San Jose, Calif. 95131
408-434-1010

A programmable software security device for Apple Computer, Inc.'s Macintosh has been announced by Software Security, Inc.

The Mactivator plugs into the small computer systems interface port of a Macintosh to provide protection against illegal use of software. Developers write small, varied routines in their applications to check for the device, and if the Mactivator is not present, the program will not run.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EdWord and ESS are registered trademarks of Trax Softworks, Inc.

Trax Softworks, Inc.

Unlocking end user productivity on your IBM mainframe.

The product is transparent to the user and is priced at $48.50. Volume discounting is available.

Software Security
1011 High Ridge Road
Stamford, Conn. 06905
800-333-0407

Barneyscan Corp. has upgraded its Barneyscanxp image editing software.

The package, which runs on an Apple Computer, Inc. Macintosh platform, will be bundled with Barneyscan's 35mm slide scanner at no additional charge. Version 1.0 was designed specifically for multimedia applications and includes improved adjustment and print preparation functions, the company said. The Barneyscan system includes a 35mm slide scanner, setup software, a Macintosh Nubus card, cables and Barneyscanxp 1.0.

It is priced at $9,495.

Barneyscan
1125 Atlantic Ave.
Alameda, Calif. 94501
415-521-3388

Training

Borland International, in cooperation with Osborne/McGraw-Hill and Mitchell Publishing, Inc., has introduced the book, *Turbo Pascal Disktutor.*

The company states that *Turbo Pascal Disktutor* was written for people who are new to the Pascal language or who need a refresher course.

Turbo Pascal Disktutor includes a streamlined version of Borland's Turbo Pascal 5.5, programming examples on disk and a written tutorial.

The suggested retail price for the package is $39.95.

Borland
P.O Box 660001
1800 Green Hills Road
Scotts Valley, Calif. 95066
408-439-1880

Data storage

A 100M-byte, low-power, single-disk, 2½-in. disk drive has been introduced by Areal Technology, Inc.

The MD-2100 utilizes glass-disk technology and is aimed specifically at the laptop and portable personal computer marketplace. The unit measures .59 by 2⅛ by 4-in. and requires one 5-volt input.

Pricing starts at $795. Deliveries are scheduled for the second quarter of 1990.

Areal
2890 N. First St.
San Jose, Calif. 95134
408-954-0360

A handheld disk converter that allows double-density 3½-in. floppy disks to be formatted to 1.44M-byte capacities has been announced by Cajun Edge, Inc.

Christened the Cajun Punch, the computer accessory is similar in design to a single-hole paper punch and comes with a one-year guarantee, regardless of the number of disks processed.

Cajun Punch costs $39.95 and is compatible with all IBM Personal Computer AT, Personal System/2 and compatible computers.

Cajun Edge
P.O. Box 2457
Hammond, La. 70404
800-448-2970

Data Technology, a division of Qume Corp., has announced a line of high-performance, caching, 15M bit/sec., enhanced small device interface hard disk controllers for the IBM Personal Computer AT and compatibles.

Designated the DTC6280-15C, the controller uses a custom 30-Hz reduced instruction set computing microprocessor and includes as much as 4M bytes of cache memory.

Suggested retail price for a base configuration of 512K-byte cache memory is $965 in single-unit quantities.

Data Technology
500 Yosemite Drive
Milpitas, Calif. 95035
408-262-7700

Corvallis' *floppy disk drive is dustproof and vibration resistant*

Corvallis Microtechnology, Inc. has announced an RS-232 port-compatible floppy disk drive designed to be both waterproof and dustproof.

The RS-FD is also vibration resistant and accepts 3½-in. floppy disks, the company said. The product may be used as an extra floppy disk drive for an IBM or compatible personal computer, and files may be transferred via modem using Xmodem or Kermit.

List price is $695.

Corvallis
413 S.W. Jefferson Ave.
Corvallis, Ore. 97333
503-752-5456

Peripherals

ALPS America has announced a 20 page/-min. printer designed for office work groups.

The ALPS LPX 2020 reportedly features 300 dot/in. resolution and is compatible with the Hewlett-Packard Co. Laserjet Series II printer. The unit comes standard with 2M bytes of memory, 34 bit-mapped fonts and two one-ream input trays. Options include a 10-bin sorter, an eight-user card, a 20M-byte small computer systems interface disk drive, a 1,000-sheet stacker and 2M to 6M bytes of add-on memory.

The LPX 2020 has a suggested retail price of $7,495.

ALPS America
3553 North First St.
San Jose, Calif. 95134
408-432-6000

A laser printer with user-selectable 800 by 400 dot/in. or 400 by 400 dot/in. resolution capabilities has been announced by Newgen Systems Corp.

The Turbops/480 is Adobe Systems, Inc. Postscript-compatible and can interface directly with IBM Personal Computers and Personal System/2s, the vendor said. It also functions with Apple Computer, Inc. Macintosh computers and AT&T Unix System V workstations.

Pricing starts at $8,495.

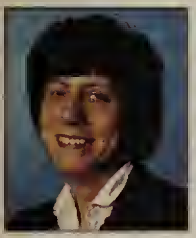
Newgen Systems
17580 Newhope St.
Fountain Valley, Calif. 92708
714-641-8600

NETWORKING

DATA STREAM

Elisabeth Horwitt

Talking to walls



IBM has had a lot of tin cans tied to its tail in the past year or two because of its failure to generate third-party support — not to mention user enthusiasm — for the Netview/PC interface.

Vendors have gleefully pointed out all of the interface's limitations, and vendors and users have both ostentatiously bypassed Netview/PC in favor of their own direct links to Netview. Vendors have complained that IBM has been about as helpful as a rock when they have asked for advice on how to link their networking systems to Netview/PC.

In other words, it's all IBM's fault.

Well, some of it is. There seems little doubt that the first DOS version of Netview/PC was a bit of a kludge, and it took IBM until last May to ship the OS/2 version. Also, development tools and testing facilities to make Netview/PC programmers' lives easier have been sadly lacking.

Then we have reports that when vendors approach IBM for advice on how to develop Netview/PC applications to manage their devices, they get told to buy their own 9370 or equivalent. This is just not practical on many networking vendors' budgets.

And IBM has gotten a reputation for being less than responsive when it comes to shipping documentation and answering phone calls from vendors interested in making Netview alliances.

A lot of this is already in the process of changing, however, according to IBM spokesmen. IBM is bringing in third-party tools that reportedly make it a

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Inside

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- Bellcore outlines intelligent network plan. Page 49.
- Compression Labs' video network improves picture quality. Page 50.

FCC, users have first quarrel

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The honeymoon between the new Federal Communications Commission (FCC) and the user community lasted just about three months. It came to an abrupt end late last month when the commission decided to maintain, on an interim basis, the 12% rate-of-return ceiling on local-exchange carriers.

The International Communications Association (ICA), a major user group, had urged the FCC to reduce the ceiling to 10.3%, which would have cut customer rates by nearly $400 million a year.

At the same meeting, the FCC disclosed its plan to implement price caps regulation for local carriers by Jan. 1, 1991 — a move that user groups said is at least premature. The price caps system would replace rate-of-return regulations with a complex set of price ceilings.

The December meeting produced a sharp reversal in users' fortunes at the FCC. Users had been pleased with two previous FCC decisions — upholding AT&T's Tariff 12 custom network deals and outlawing "strategic pricing" by local carriers — made under the leadership of Chairman Alfred C. Sikes [CW, Dec. 4, 1989].

"What we thought we'd be hearing from this commission was more concern about ratepayer interests. What they told us in the Dec. 21 meeting is that when it comes to dollars and cents issues, there is no sincere commitment to deliver on ratepayer interests," commented Brian R. Moir, ICA's counsel.

The ICA, joined by the Consumer Federation of America and MCI Communications Corp., argued that improved economic conditions and a declining cost of capital justified dropping the profit ceiling for local telephone companies to 10.3%.

The FCC staff had recommended a ceiling of 11.25%, several sources reported. But the local telephone companies said a 12% rate or higher was needed so they can invest in the modernization of their networks.

The FCC said that 12% remains in the "zone of reasonableness" and will be retained on an interim basis, pending completion of a full-scale examination of the proper rate-of-return ceiling.

Sikes stressed that the FCC is embarking on a comprehensive program "aimed at improving the efficiency of local-exchange carriers and enhancing the potential for increased investment to modernize our national telecommunications infrastructure."

Commissioner Andrew C. Barrett supported the decision but added that the telephone companies must show a "serious commitment" to greater invest-

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Bridge/routers are ideal solution for some, not all

ANALYSIS

BY JOANIE M. WEXLER
CW STAFF

With hybrid bridge/router products emerging in the marketplace, information systems professionals charged with linking local-area networks to each other and to wide-area networks (WAN) may be left wondering if there is any reason to install separate devices rather than the hybrids.

But there is no clear-cut answer for one and all. The decision will most likely depend on the size and similarity of the networks to be connected, according to industry analysts.

"For users with heterogeneous networks and devices, we'll eventually see the hybrid devices overtake the individual products," predicted Gigi Wang, director of data communications research at The Yankee Group, a research and consulting firm in Boston.

Hybrid products have emerged to combine the attributes of bridges, which serve as LAN "extension cords," and more intelligent routers, which route data packets containing specific network-layer protocols directly to the receiving station. The hybrid products, however, also incorporate the drawbacks of the plain-vanilla products.

For example, routers, while they contain more functionality than bridges, are generally slower because they must unpack and examine the data packets to determine where the data should be sent, according to Michael Howard, executive vice-president of internetworking at Infonetics, Inc., a research and consulting firm in Santa Clara, Calif.

"Bridges [can] pass through 15,000 packets per second, while routers transmit probably only a few thousand," Wang explained.

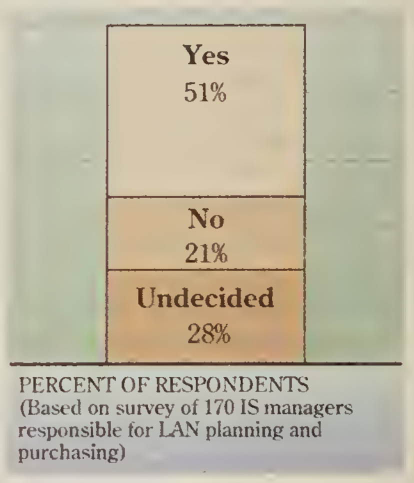
Certain hybrid products, often called "brouters," which route certain protocols and bridge others through a single device, retain the slow properties of the router because they must also examine the data packet to determine whether they should function as a bridge or router, according to Howard.

Brouters, however, are efficient in networks containing a

Continued on page 48

Majority rules

In a recent survey, more than half of the respondents said they plan to use internetworking devices in 1990



SOURCE: YANKEE GROUP CW CHART: DOREEN DAHLE

Stratus helps bring 911 to U.S. West users

BY ELISABETH HORWITT
CW STAFF

PORTLAND, Ore. — U.S. West Communications has incorporated Stratus Computer, Inc. hosts into an intelligent networking system that will make it possible to provide 911 services to many small communities for the first time, the regional holding company said.

Until now, U.S. West's operating companies have been unable to provide a 911 emergency number to some 600 counties within the holding company's 14-state territory, according to company spokeswoman Laura Simonton. The main obstacle has been that the AT&T 1AESS central office switch that is the "predominant technology for the current [911] configuration" is too big and expensive to cost-justify for small and medium-size customer bases, she added.

During the past 2½ years, U.S. West's government, education and public safety division has developed a 911 platform that will work with any central office switch that supports call forwarding — even old-style analog switches, Simonton said.

The system also significantly lowers the cost of customer premises equipment used by police and fire department dispatch centers, according to Chuck Anderson, U.S. West's project director for public safety. The current configuration requires such agencies to purchase or lease special network terminals and data processors that receive calls and call number identification information and key it into the local telephone company's database in order to get the caller's location.

In the new configuration, a Stratus XA2000 Continuous Processing System will do the actual matchup of the caller's telephone number and location, then route the information to the dispatch agency's terminal while a Mitel Corp. GX5000 switch routes the call to the agency's trunk line, Simonton said. This cuts call processing time and allows dispatch agencies to access the service with standard terminal and voice sets, she added.

U.S. West chose the Mitel GX5000 because it is "a relatively small but feature-rich" system that was designed to handle only about 5,000 customers as a central office switch but can handle the more sporadic 911 calls for a community of up to 500,000 users, Simonton said. In the near future, multiple platforms will be linked to support even greater numbers of users, U.S. West said.

U.S. West filed its network disclosure statement with the Federal Communications Commission last November and plans to begin an eight-month technical trial of the service beginning in May. Initial deployment within U.S. West's territory is scheduled for first quarter of next year. It will also be made available in the future to U.S. West customers throughout the U.S. and overseas.

Behold the big surprises in store from the future of EDI

BY ALAN J. RYAN
CW STAFF

WASHINGTON, D.C. — Issues like global warming and overflowing landfills are not likely to change much as our planet spins closer to the year 2000. But technology's rapid pace, especially in the area of electronic data interchange (EDI) and expert systems, will bring about some breathtaking advances that we will all see by the next century.

That is according to futurist Clement Bezold, executive director of The Institute for Alternative Futures, speaking last month at the National EDI Systems Conference & Exhibit. The conference was sponsored by the Electronic Data Interchange Association.

Bezold said that during the next decade, EDI — or whatever it evolves into — will move well beyond its business uses of today to find a comfortable niche in the home as well.

"Like other segments of the information industry, EDI will look very different 10 years from now," he said. Currently, EDI is still in its infancy, but as with other evolutionary advances, such as speech and written language, EDI will become increasingly important as it becomes a critical component of universal information access.

"Anyone or any machine would be able to speak to anyone or any consenting machine worldwide" sometime during the early part of the next century, Bezold said.

A future for EDI

Today, EDI has proven its ability to reduce the costs of processing purchase orders in fields such as the automotive industry. Tomorrow, EDI is expected to become increasingly important in areas such as electronic funds transfer, smart cards and point-of-sale systems, he said.

EDI will be an essential component in expert systems, the futurist said, and will be incorporated through expert systems into "smart" buildings, offices and homes. There will be single-step database access, he said. Also, EDI and expert systems will offer businesses the ability to conduct real-time market research and may help firms move closer to the paperless office.

Talking houses?

In the home, technology will allow people to talk to their television sets to change the channels or possibly talk to the house itself to raise or lower the temperature.

"The cost of voice-interactive chips will decline significantly. Those pieces will be in televisions at the turn of the century," Bezold said. Additionally, more and more homes will have Integrated Services Digital Network systems in them to allow them much greater computing ability.

The home information center might be a telephone, the entertainment center or even a stand-alone room, he said.

There will also be advances in home health monitoring, he said. Massive storage within the home, with several gigabytes available for entertainment, will make financial data, child-care and elder-care information, eating pattern monitoring, nutritional interest information, education and information on community resources and bulletin boards readily available, Bezold added.

The next century may also bring about systematic, noninvasive monitoring such as wristwatch-like devices that will continually monitor the users' heart and pulse rate and may even be equipped to extract minuscule amounts of blood for instantaneous testing, he said. The "watch" could contain information linked to the users' genetic profile, he said. "The human gene will be mapped out in the next 10 to 15 years."

Using systems, he said, "you'll be able to compare how your doctors and your hospitals are doing with others around town." This type of consumer advocacy will involve polling consumers right in their own homes, probably through television sets, and will extend to areas such as electronics purchases. For instance, a consumer wishing to purchase a videocassette recorder will be able to plug into his terminal or television to get a consumer rating on the product.

Hybrids

CONTINUED FROM PAGE 47

variety of protocols, which can be handled by protocol-independent bridges. They also are good for those with network partitioning requirements for security, provided by routers.

Other hybrids, often called "routing bridges" or "learning bridges," are more intelligent bridges that set up address tables. When data packets travel through the bridge to another LAN, the device remembers the path for the next transmission. Some routing bridges include other intelligent features, such as specialized filtering.

Bridges, which interconnect multiple LANs at the data link layer, either locally or remotely, typically receive all messages on each network and forward messages throughout all networks to which they are connected. Because of this, they can clutter up the communications channel with unnecessary traffic, resulting in a "network storm."

Routers support specific protocols — such as Transmission Control Protocol/ Internet Protocol or Xerox Network Systems — sending data to specific network stations and thereby avoiding the traffic problem.

"Strategically placing bridges and routers throughout the network can capitalize on the advantages of each," Howard noted.

Howard said his company recommends the use of routers if there are more than seven hops between any two stations. He also painted a scenario for bridges.

"If a company has five logically separate work units within a building, each department could be on a separate LAN, and the LANs could be connected with bridges if 80% or more of the traffic is intradepartmental," he said.

In this configuration, he explained, a relatively small amount of network traffic would be broadcast across LANs, so network storms would not be much of a problem, and network response time would be faster than with a router or brouter.

"A general principle people are following for larger networks is to route everything you can and bridge a limited number of things you have to," said Len Bosack, principal scientist at Cisco Systems, Inc., a maker of internetworking equipment in Menlo Park, Calif.

For example, certain protocols, such as Digital Equipment Corp.'s Local Area Transport, do not contain the necessary specifications to make them routable, so they are supported by bridging.

Bosack said that a router lets you build a network that "goes forever" and added that with bridges, after a certain number of extensions, "the background noise gets bad."

FCC

CONTINUED FROM PAGE 47

ment in network facilities.

Moir said it appears that the regional Bell holding companies have plenty of money for making investments. "We've got to let them overearn so they can go invest in cellular systems all over Europe and fiber-optic systems in the Pacific? Who are we kidding?" he said.

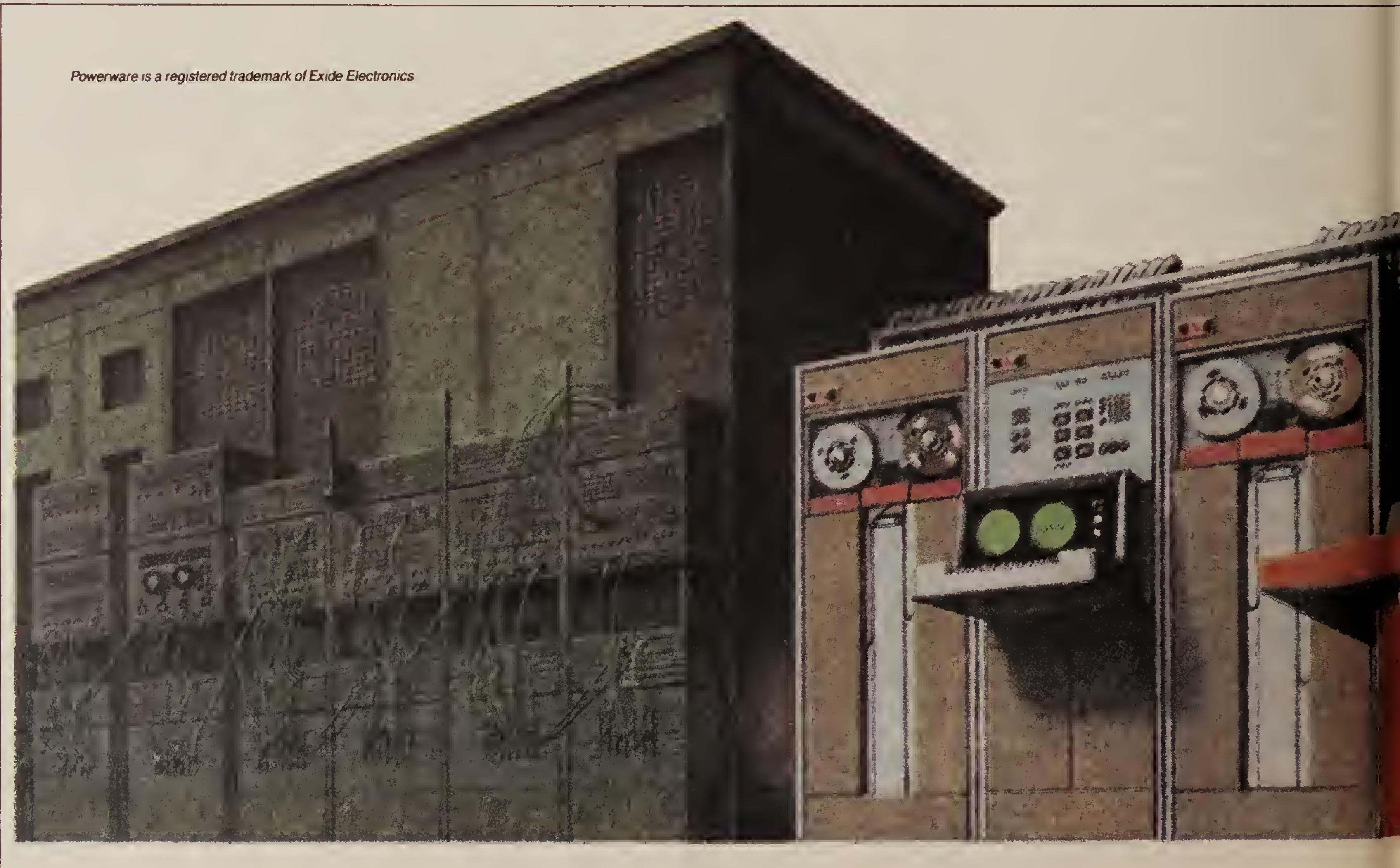
Richard Firestone, chief of the FCC's Common Carrier Bureau, said the complete examination of rate of return — called represcription — is needed to create "the best starting point possible" for a new price caps regime.

But Moir charged that the action was mostly a political maneuver designed to make price caps look good. By allowing local carriers to overearn this year and then effectively lowering the rate of return when it implements price caps next year, the FCC can claim that price caps is saving money for consumers, he said.

Moir said users are skeptical that price caps for local carriers will be an improvement for ratepayers. He stressed that before price caps are implemented, the FCC should fix several long-standing flaws in FCC regulations and enforcement that allow carriers to "gouge" ratepayers.

In an interview, Moir hinted that the ICA and other consumer groups will be compiling a detailed list of these grievances and will take them to congressional committees with oversight authority over the FCC.

"If the commission was doing its job, instead of talking about price caps and all of these make-work projects, maybe it could do something that is really in the interests of ratepayers," Moir said.


Powerware is a registered trademark of Exide Electronics

BIT BLAST

British Telecom reduces charges for ISDN installation by 50%

British Telecommunications PLC has announced reductions in charges for its Integrated Services Digital Network (ISDN) service, known as ISDN 30. Installation charges for converting from analog to digital lines will be cut as much as 50%, with installation charges for dial-in access to the service reduced by as much as 25%, the UK carrier said.

Hayes Microcomputer Products, Inc. and UK-based **GPT** have agreed to jointly develop, manufacture and distribute ISDN terminals. GPT already supports ISDN on its systems. Hayes also announced the availability of an enhanced ISDN version of its Standard AT Command Set for modem communications.

Northern Telecom, Inc. announced the start of trials to test ISDN interoperability between its internal communications network and the public networks of **U.S. Sprint Communications Co.** and **MCI Communications Corp.** Northern's network consists of SL-1 PBX systems and SL-100 Meridian Customer Defined Network nodes.

AT&T and the member companies of **Telecom Canada** have announced plans to initiate what they claim will be the first cross-border testing of intelligent networking based on Signaling System 7 (SS7). Now being deployed by long-distance carriers around the U.S., SS7 is said to be the basis for providing end-to-end ISDN services across different providers' networks.

GSI-Danet, Inc. has announced the availability of OSI Test/500, which is said to help software developers ensure conformance of their products with the CCITT X.500 electronic mail directory standard. The company also announced a second-generation OSI Test/400 system, which is said to conform to the X.400 E-mail standard.

The National Institute for Standards and Technology and the **Corporation for Open Systems** (COS) have agreed to jointly develop a testing program to ensure that networking products purchased by federal agencies comply with the Government Open Systems Interconnect Procurement (GOSIP) standard. Agencies are required to use GOSIP specifications in their networking procurements as of Aug. 15, 1990.

COS, the **Promoting Conference for OSI** in Japan and the **European Standards Promotion and Application Group (SPAG)** have agreed to set up the C-P-S Forum, which will meet every six months to coordinate the three organizations' Open Systems Interconnect testing throughout the world.

Data General Corp. recently became the latest major vendor to license Technology Concepts, Inc.'s Community software, which provides compatibility with **Digital Equipment Corp.'s** Decnet Phase IV. Community will link DG's Aviion line of reduced instruction set computing-based Unix workstations to DEC hosts via Decnet, the vendors said.

Horwitt

CONTINUED FROM PAGE 47

lot easier to develop Netview/PC applications to handle various networking systems — one already announced, three more to come within a month, IBM says. Last fall, IBM also announced a testing facility for Netview/PC applications and added Netview referrals to its vendor hot-line service.

In fact, IBM will be moving heaven and earth (and its own ponderous organization, which may be a lot tougher) to introduce new ways to smooth the path of multivendor Netview/PC support in the coming months, according to Don Haile, enterprise systems director of software systems.

"Sometimes IBM is careful [read: secretive] with its interfaces, to put it nicely, but we have bet the farm on Netview," he adds.

Specifically, IBM has a high strategic stake in Netview's success as a multivendor management system, so it just doesn't make sense for the big guy to cut off his own nose by thwarting vendors eager to support the platform. Those unanswered phone calls were probably just bureaucratic glitches, Haile suggests.

There is also some indication that the limitations and scarcity of third-party Netview/PC connections are partly the fault of so-called supporters in the vendor community.

"I have never seen an implementation through Netview/PC done through a third-party vendor where the vendor made any attempt to exploit the real feature range of Netview," says Tom Nolle, president of CIMI Corp.

When users complain, Nolle adds, vendors as often as not point the finger at IBM, the ideal scapegoat, with its reputation for safeguarding its secrets while giving lip service to "openness."

"I've heard users say, 'Vendors told us that Netview/PC doesn't support this kind of command,' and it does; the vendor just wouldn't do it," Nolle says.

I'm not just trying to give IBM a fair shake. The phenomenon of half-hearted third-party support afflicts other "integrated" network management systems besides Netview, and it will hurt both users and vendors in the long run.

> INDIVIDUAL network vendors are being pressured to buy into the major platforms.

"Whenever a vendor comes out with a net management system, a thousand third parties come out and say 'we'll support this' but actually do the absolute minimum to get away with and not be accused of commercial fraud," Nolle says.

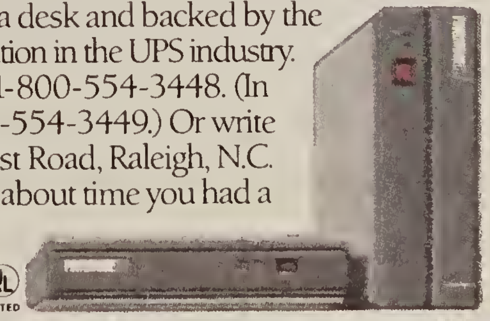
It's easy to see why this happens. Users are now making integrated network management a top priority, so individual network vendors are being pressured to buy into the major platforms.

But which one? DEC, IBM and AT&T all have strong user bases, and the Open Systems Interconnect (OSI) standard may be the dominant platform in the long term. Few vendors have the resources to support all of them, so they put together links to all of them, made up of spit and shoestring.

The dire effects of this are only beginning to be felt. Users such as GE, which has put its network management money on Netview/PC, get disappointed when they actually test the links to their existing networking systems. More cynicism about the so-called integratedness of these systems results, further putting users off the products and allowing network vendors to claim, "Well, users didn't really want this stuff anyway."

IBM's application generator strategy should help the situation some; even more helpful will be when everyone does, in fact, support OSI so the third-party networking vendors can support all the platforms in one fell swoop.

Horwitt is a *Computerworld* senior editor, networking.



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Bellcore makes it easier to justify

Bellcore recently published details for its proposed first phase of Advanced Intelligent Network (AIN), a plan that promises to make it easier for regional carriers to justify the cost of deploying new, enhanced networking services.

A jointly held research and development subsidiary of the regional Bell holding companies, Bellcore proposed that the intelligence needed to support enhanced services be implemented on networking elements that are separate from the switches that actually handle calls. This would eliminate the need for expensive central office equipment upgrades whenever new services are introduced.

The report discussed how products based on Release 1 of its AIN specifications could be introduced by 1993.

Videoconferencing hits new 'lows'

BY ELLIS BOOKER
CW STAFF

SAN JOSE, Calif. — Compression Labs, Inc. this week is expected to introduce a new videoconferencing system for low-bandwidth networks that it claims improves picture quality by a factor of 2:1.

Low-bandwidth systems was the fastest growing segment of the $60 million, full-duplex videoconferencing market in the U.S. last year, according to Steve Reynolds, a senior analyst for videoconferencing at New York-based Link Resources Corp.

Compression's latest introduction, he added, may have been a response to rival Picturetel Corp. in Peabody, Mass., which was gaining a reputation as having a better low-bandwidth offering.

According to Reynolds, both Compression and Picturetel see their future in low-cost, low-bandwidth products used as basic office communications tools. "That's where they can make money in the long haul," he said.

> THE logistical and economic benefits of delivering videoconferencing with a modem over the nation's predominantly analog local phone networks are enormous.

Compression estimates its 1989 revenue at $28 million, with roughly 50% of that coming from its low-bandwidth product, the Rembrandt 56. This is an increase over the 25% contribution it made in 1988.

Compression, in fact, recently moved to target the last frontier of low-bandwidth videoconferencing — namely, the nation's huge analog phone network. In December, it entered an $11 million venture capital agreement with Paine Webber R&D Partners II, L.P. to develop a videophone.

Current full-motion videoconferencing requires coder/decoders to digitize and compress a video signal and transmit it over a digital line and 56K bit/sec. or higher digital transmission facilities.

The logistical and economic benefits of delivering videoconferencing with a modem over the nation's predominantly analog local phone networks are enormous.

The Paine Webber deal, which gives the venture capital firm rights to technology licensing, royalties on developed products and warrants to purchase up to 700,000 shares of Compression stock, also includes plans for Compression to develop a high-definition television coder/decoder.

Compression's Rembrandt II/06, which will be available in the first quarter, is the first to use the company's proprietary CTX compression algorithm. The unit supports 56K bit/sec. to 384K bit/sec. speeds. Future options include compatibility with Compression's higher speed coder/decoders and support for the CCITT's soon-to-be-approved videoconferencing standard, H.261.

Users can run the new coder/decoder in the CTX mode or in a second mode that is compatible with Compression's existing line of Rembrandt 56 coder/decoders.

The Rembrandt II/06 has a base price of $31,500, and the company is offering an upgrade option to Rembrandt 56 customers who purchased their systems since October 1988.

The announcement of the Rembrandt II/06 video coder/decoder comes on the heels of AT&T's selection of Compression two weeks ago as the supplier of videoconferencing gear for its portion of the massive U.S. government Federal Telecommunications System 2000 contract.

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NEW PRODUCTS

Local-area networking hardware

Multitech Systems, Inc. has unveiled its EN-Series of Ethernet local-area network products.

The products include network interface cards for IBM's Personal Computer bus and Personal System/2 Micro Channel Architecture-based personal computers.

The series supports 10Base5 and 10Base2 coaxial cabling and 10BaseT twisted-pair cabling, the vendor said. Prices range from $349 for a PC Bus card to $1,995 for the twisted-pair hub.

Multitech
2205 Woodale Drive
Mounds View, Minn. 55112
612-785-3500

TRW Information Networks has announced a combination hardware and software product designed to provide MS-DOS users with Transmission Control Protocol/Internet Protocol-based IEEE 802.3 Ethernet networking capabilities.

The PC2001 Version 4.0 Ethernet adapter card is a full-slot personal computer card that supports IBM Personal Computers and compatibles. The software loads all protocol-related software onto the adapter board, which is available with connectors for Ethernet, thin Ethernet or 10BaseT-compliant twisted-pair wiring.

The PC2001 uses 28K bytes of resident memory and is priced from $595.

TRW Information Networks
23800 Hawthorne Blvd.
Torrance, Calif. 90505
213-373-9161

OS/2 networking

Corporate Microsystems, Inc. has announced a data communications system designed specifically for the OS/2 operating environment.

According to the vendor, the Mlink Data Communications System provides such features as terminal emulation, file transfer and data compression. A built-in script language facilitates automated operation and integration with user applications. Mlink operates in OS/2's native protected mode.

A runtime version of the system sells for $310, and a development version is priced at $395. Volume shipments are scheduled to begin in February.

CMI
Box 2059
Mountain Support Road
Lebanon, N.H. 03766
603-448-5193

Network services

A public data network for large-volume data transmission has been announced by Graphnet, Inc.

The Graphnet Freedom Network PDN provides high-speed, fault-tolerant U.S. and international access by integrating standard packet switching, circuit switching and digital multiplexing within one network. Asynchronous devices can communicate via the network at speeds up to 19.2K bit/sec., and synchronous devices can accommodate a 64K bit/sec. data transfer rate.

Pricing varies depending on customer requirements and configurations.

Graphnet
329 Alfred Ave.
Teaneck, N.J. 07666
201-837-5100

Links

Emulex Corp. has announced an eight-port Transmission Control Protocol/Internet Protocol terminal server aimed at the AT&T Unix marketplace.

The Performance 4008-T was designed as a low-end product offering for customers who need to connect eight terminals or less to an Ethernet network, the company said.

The server supports data speeds up to 38.4K bit/sec. and costs $2,495.

Emulex
P.O. Box 6725
Costa Mesa, Calif. 92626
714-662-5600

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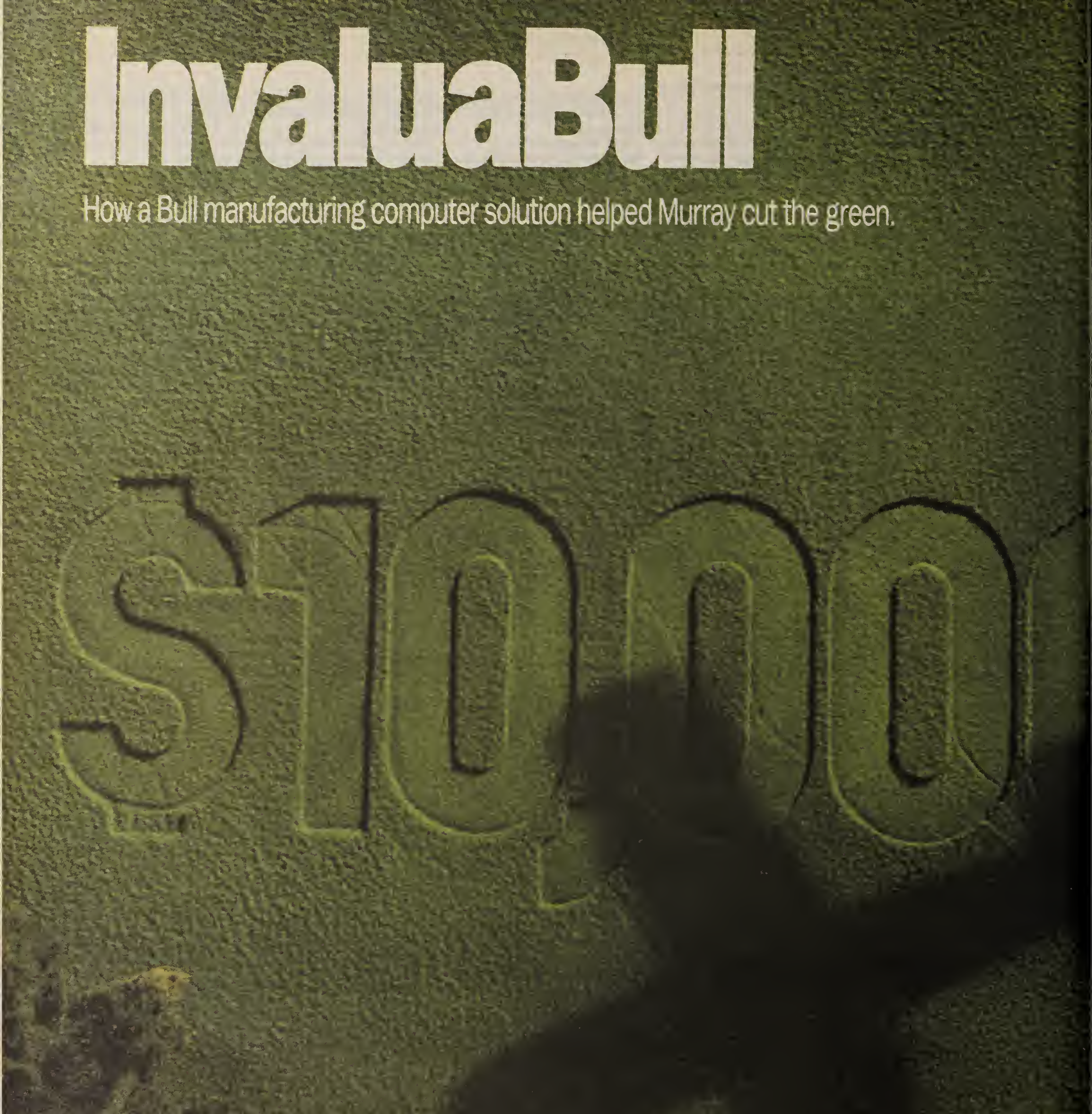

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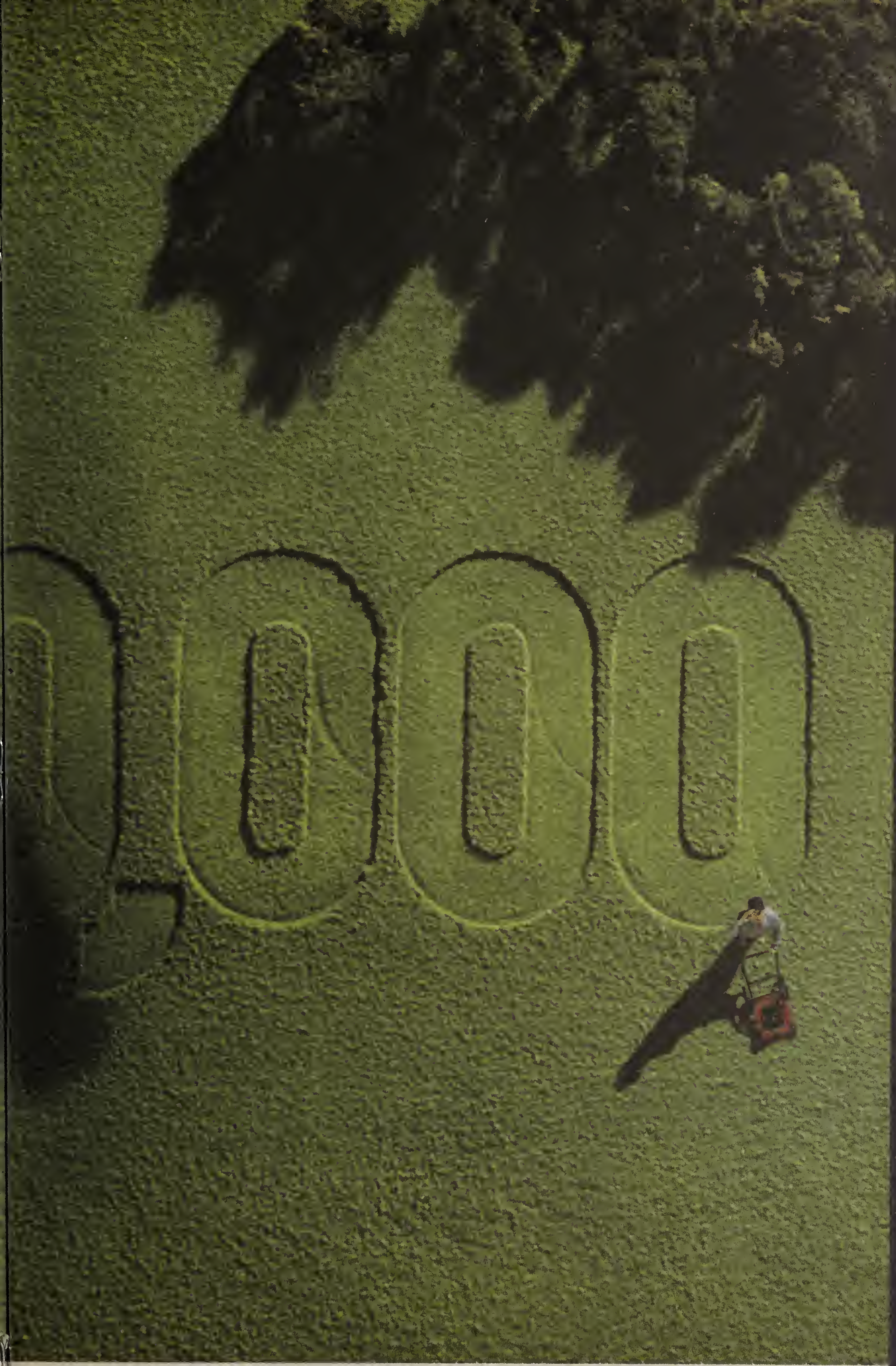

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Nynex Information Solutions Group, Inc. has announced its Lanpath Faxserver, a local-area network-based facsimile communications system designed to run on OS/2 servers that support DOS-based workstations.

The fax allows personal computer users on Netbios-compatible LANs to send a fax, dial a telephone number and generate a cover sheet simultaneously, the vendor said.

The product is priced at $3,295.

Nynex
4 W. Red Oak Lane
White Plains, N.Y. 10604
914-644-7844

The Princeton University Office of Computing and Information Technology has released a networking software package that allows IBM VM systems to communicate with IBM's Remote Spooling Communications Subsystem (RSCS) Network Job Entry protocol over Transmission Control Protocol/Internet Protocol network facilities.

Called Vmnet, the software uses standard system calls and does not require changes in VM, CMS or RSCS, the vendor said.

An annual license costs $5,000.

Princeton University
87 Prospect Ave.
Princeton, N.J. 08544
609-258-2751

Electronic mail

Professional Productivity Corp. has announced Notework 1.0.6, a pop-up electronic mail package created for the Novell, Inc. Netware environment.

The product requires 5K bytes of random-access memory and allows users to send or receive messages without leaving their application program, the vendor said. It supports binary file attachments as well as cut and paste functions from the application screen.

The software is priced from $495 for the first eight users.

Professional Productivity
72 Kent St.
Brookline, Mass. 02146
617-738-5295

Modems

Racal-Vadic has announced a digital service unit with V.32 dial-backup facilities that was specifically designed to increase network uptime by automatically switching from digital lines to analog lines when a problem is detected.

Designated the DSU 500 DB, the device transmits digital data at speeds of 9.6K, 4.8K and 2,400 bit/sec. over AT&T's Dataphone Digital Service leased lines.

The unit costs $2,595.

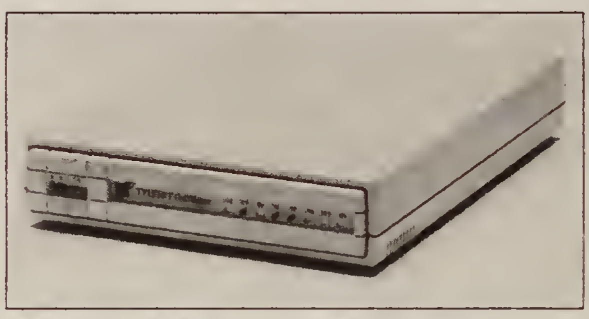
Racal-Vadic
1708 McCarthy Blvd.
Milpitas, Calif. 95035
408-432-8008

Touchbase Systems, Inc. has announced an internal modem designed specifically for Toshiba America, Inc.'s laptop personal computers.

Dubbed the Worldport 2496IT, the device features a Group III, 9.6K bit/sec. facsimile and a 2,400 bit/sec. data modem in one integrated package.

The unit sells for $699. An external battery-powered version is also available.

Touchbase
160 Laurel Ave.
Northport, N.Y. 11768
516-261-0423



Telebit's cellular modem *can transmit at speeds up to 16.8K bit/sec*

Telebit Corp. has introduced Cellblazer, a cellular modem that can transmit data at speeds up to 16.8K bit/sec. The product utilizes the cellular network to transmit data from car, truck or other mobile locations to micros, minis or mainframes. It is offered as an internal personal computer card for $1,295. A rack-mount card configuration and a stand-alone unit are $1,495 each.

Telebit
1345 Shorebird Way
Mountain View, Calif. 94043
415-969-3800

A combination facsimile and modem system designed specifically for use with laptop computers has been announced by Xecom, Inc.

Faxdat provides 9.6K bit/sec. Group III transmit and receive, with fallback to 7.2K, 4.8K and 2,400 bit/sec. speeds. The unit fits into the expansion slot of Compaq Computer Corp.'s SLT/286, NEC Technologies, Inc.'s Prospeed 286, Toshiba America, Inc.'s 1600 and Zenith Data Systems' Supersport laptop machines. Faxdat costs $625.

Xecom
374 Turquoise St.
Milpitas, Calif. 95035
408-945-6640

Patton Electronics Co. has introduced a full-duplex, 19.2K bit/sec. short-range modem.

Designated the Model 1009, the unit measures 2½ by ¾-in. and comes equipped with an RJ-11 jack or terminal posts to accommodate twisted-pair connections. It operates with IBM Personal Computer ATs and compatibles, the NCR Corp. Tower series and Unisys Corp. 7000 series machines and allows the units to link two data terminals up to 17 miles apart over twisted pair. It costs $70.

Patton Electronics
7958 Cessna Ave.
Gaithersburg, Md. 20879
301-975-1000

Electronic data interchange

General Electric Information Services (GEIS) has announced the availability of Interchange Level Service on its EDI*Express electronic data interchange (EDI) network service.

The Interchange Level Service will enable customers to select a level of service commensurate with their application requirements. The additional function complements Document Level Service, which has been available along with EDI*Express since December 1985, and pricing has been restructured to reflect the two levels of service.

GEIS
401 N. Washington St.
Rockville, Md. 20850
800-EDI-KNOW

Western Union Corp. has enhanced its electronic data interchange (EDI) service to provide Freeform Conversion service to EDI users whose trading partners require paper-based records, the company said.

With Freeform Conversion, buyers can accept EDI-generated transaction sets without making an immediate investment in translation software or computer hardware.

Pricing varies depending on customer transaction requirements, according to the company.

Western Union
1 Lake St.
Upper Saddle River, N.J. 07458
201-818-5000

Gateways, bridges, routers

A router that interconnects Apple Computer, Inc. remote Appletalk networks via high-speed synchronous communication services has been introduced by Engage Communications, Inc.

Syncrouter is capable of linking T1, Digital Data Service, fiber-optic lines and satellite links in a corporate setting to provide a wide-area networking environment, the company said. Using the Chooser, Macintosh users can access computers, printers, file servers and other devices at remote sites.

The product is priced at $1,895.

Engage Communications
Suite 4
756 Marlin Ave.
Foster City, Calif. 94404
415-358-0264

An internetwork router for secure network interconnection in Defense Data Network and private network enviroments has been introduced by Cisco Systems, Inc.

The Tempest Gateway Server is fully NACSIM 5100A compliant and runs across Ethernet and serial communications lines at rates up to 12,000 packet/sec.

The router is priced from $22,968, which includes a nine-slot rack-mountable chassis assembly, a 12-MHz Motorola, Inc. 68020 processor and router system operating firmware. One Ethernet port and one low-speed synchronous serial port are also included.

Cisco
1350 Willow Road
Menlo Park, Calif. 94025
415-326-1941

Andrew Corp. has introduced the Netlynx/5252, a gateway targeted for IBM midrange computer users.

The product allows any Netbios-compatible local-area network to communicate with an IBM System/34, 36, 38 or an IBM Application System/400. Supported LAN interfaces include Token-Ring, Arcnet, Ethernet and Starlan.

The gateway is available for $1,995.

Andrew
2771 Plaza Del Amo
Torrance, Calif. 90503
213-320-7126

ILAN, Inc. has announced Version 1.10 of Transpost/VAX, the company's gateway product for the Digital Equipment Corp. VAX platform.

According to the company, the latest release gives Banyan Systems, Inc. Virtual Networking Software network users electronic mail communication service with DEC's All-In-1 office automation and messaging system. Transport/VAX was initially released in October 1989 as a transparent electronic mail gateway between Banyan's Vines E-mail and DEC's Vaxmail products.

Version 1.10 retains the original pricing of $3,495 per server.

ILAN
640 Lakeview Plaza
Columbus, Ohio 43085
800-537-3147

Crosscom Corp. has announced that its entire line of LAN-WAN bridges now support fractional T1. Fractional T1 is supported by the vendor's entire Ilan product line, including bridges for Ethernet, Token-Ring and fiber-optic LANs. The service is offered at no extra cost to customers.

The company has also announced that IBM Netview software is now available for its LAN-WAN bridges. Called IMS-NV, the new capability allows bridges to be managed via the IBM network management software running on IBM mini and mainframe computers. It is priced at $4,950, which includes IMS-NV software, a Token-Ring or Ethernet controller and an instruction manual.

Crosscom
P.O. Box 699
Marlboro, Mass. 01752
508-481-4060

Management Systems Designers, Inc. has introduced Promulgate/PC, a personal computer-based electronic mail gateway that ties 3Com Corp. and AT&T Unix-based mail networks together.

The gateway requires a dedicated Intel Corp. 8086-, 80286- or 80386-based machine with 640K bytes of memory and a 3Com Etherlink card.

A site license for up to 50 users is priced at $5,995, and a site license with unlimited users costs $9,995. Multiple quantity discounts are also available.

Management Systems Designers
131 Park St. N.E.
Vienna, Va. 22180
703-281-7440

Micro-to-host

Attachmate Corp. has announced an Evaluator's Guide for those who use or plan to purchase personal computer-to-mainframe products.

The guide is divided into two main sections: PC-to-IBM mainframe technology and a step-by-step approach to evaluating PC-mainframe products. The technology section includes a detailed overview of 3270 architecture and examines both stand-alone PC-to-mainframe connections and local-area network-to-mainframe connections. The Evaluator's Guide comes in a three-ring notebook and is available for $60.

Attachmate
13231 S.E. 36th St.
Bellevue, Wash. 98006
800-426-6283

Host-to-host

Unisys Corp. has released a local-area network communications product for its 1100/2200 Series mainframe systems.

The Host LAN Controller allows multiple mainframe hosts to attach directly to an IEEE 802.3 Ethernet LAN and is especially suited for applications that rely on large data file transfers between the 1100/2200 systems, the company said. The product is connected via the host's block multiplexer channel and is currently available for shipment.

The extended-term payment (five-year lease) price is $20,000, and monthly maintenance charges are $65.

Unisys
P.O. Box 500
Blue Bell, Pa. 19424
215-542-5367

EXECUTIVE TRACK

Troy Bailey has been promoted to IS manager at **North Colorado Medical Center** in Greeley, Colo.

Bailey was previously a supervisor in the IS department at the medical center. He holds a bachelor of science degree in MIS from Colorado State University.

....

Marilyn A. Soulsburg was named assistant director of the **Internal Revenue Service's** Brookhaven Service Center in Holtsville, N.Y.

The center processes federal tax returns from Brooklyn, Manhattan and New Jersey.

Soulsburg was most recently chief of the IRS collection division in San Francisco. She was named to her current position after completing the IRS executive selection and development program last year.

Soulsburg began her IRS career in 1970 as a revenue officer in Los Angeles. She holds a bachelor's degree in history from Indiana University.

She succeeded **Richard Marsh**, who was named director of the IRS Memphis Service Center.

....

Gary Kelley was promoted to director of administration at **Dennison Stationery Products Co.** in Framingham, Mass., a new subsidiary formed by the consolidation of Dennison National and Dennison Carter's.

Kelley joined Dennison in 1982 as IS training coordinator. He was previously a consultant at Ernst & Whinney.

....

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Tracking a whirlwind career

Jay W. Forrester arrived at MIT in 1939 and planned to spend a year at the Cambridge, Mass., campus getting a master's degree in engineering. Fifty years later, Forrester has yet to leave.

Forrester turned 70 in 1989 and "retired" as a faculty member in accordance with MIT policy. He still maintains an office at the school, however, continuing to advise doctoral students and write articles and books on his field of expertise, system dynamics.

MIT is not anxious to have Forrester turn to golf and gardening. At a university where the outstanding is commonplace, Forrester is a legend, just as he is in the computer industry. Not only did the Nebraska native successfully lead MIT's pioneering work in the creation of digital computing with the Whirlwind and SAGE Air Defense computers, but he brought the school more than $20 million in license fees in the 1950s for his invention, magnetic core memory.

Whirlwind ushered in the era of interactive digital computing as well as the concept of time-sharing. Many computing concepts still in wide use today can trace their roots to Whirlwind.

Digital Equipment Corp. President Ken Olsen was a Forrester protege on the Whirlwind project, and many of the guiding principles that made Whirlwind such a success were incorporated into DEC's culture.

Forrester himself became fascinated with the group dynamics of the projects he had overseen. For the past 34 years, he has pioneered the study of system dynamics, turning out countless articles and books on the subject.

Last October, Forrester and his codirector on the Whirlwind project, Robert Everett, were called to the White House, where President George Bush presented them with the National Medal of Technology for their pioneering work in computers.

Computerworld *Features Editor Glenn Rifkin recently met with Forrester at his MIT office to look back at his unparalleled career.*

DAVID LEIFER

MIT's Forrester *pioneered the field of corporate and social system dynamics*

How did you get involved with Whirlwind?

At the end of World War II, I was thinking of leaving MIT, possibly starting a small company in feedback control devices, which would have been a natural kind of outgrowth of my work at MIT. And Gordon Brown, who was head of the Servomechanisms Lab, presented me with a dozen possible projects to see if any of them would interest me in staying. I picked one of them, which was the Navy's desire to have a computer built that would predict the sta-

Continued on page 62

ASM looks within for new leader

BY CLINTON WILDER
CW STAFF

For new leadership in 1990, the Association for Systems Management (ASM) has turned to one of its own. The Cleveland-based ASM named 24-year member Steve Adamson as its executive director, effective Jan. 1.

Adamson had served as acting executive director since July, after the resignation of David B. Sturtevant. A search took place during the interim, but the ASM came back to Adamson, a veteran information systems professional and management consultant most recently based in Fullerton, Calif.

"Some people have said that it's like the inmates taking over the asylum," the amiable Adamson jokes, "since I'm a former ASM volunteer moving over to the other side. But I'm reasonably comfortable with that."

Adamson says the 8,500-member association must aggressively recruit new bodies, as membership has stalled in the past two years.

"Anytime you're standing still in this business, you're losing ground," he says.

ASM, founded in 1947, has traditionally represented a broad cross section of IS job levels, and Adamson says that will continue.

In both recruiting and program offerings, he said the association will target IS professionals who have moved out of central IS organizations and into business units. "More and more, we see information systems analysts and project leaders who are back in the user community under a variety of job titles," he says. "We have to be prepared and adjust our own goals and the services we provide in order to meet that change."

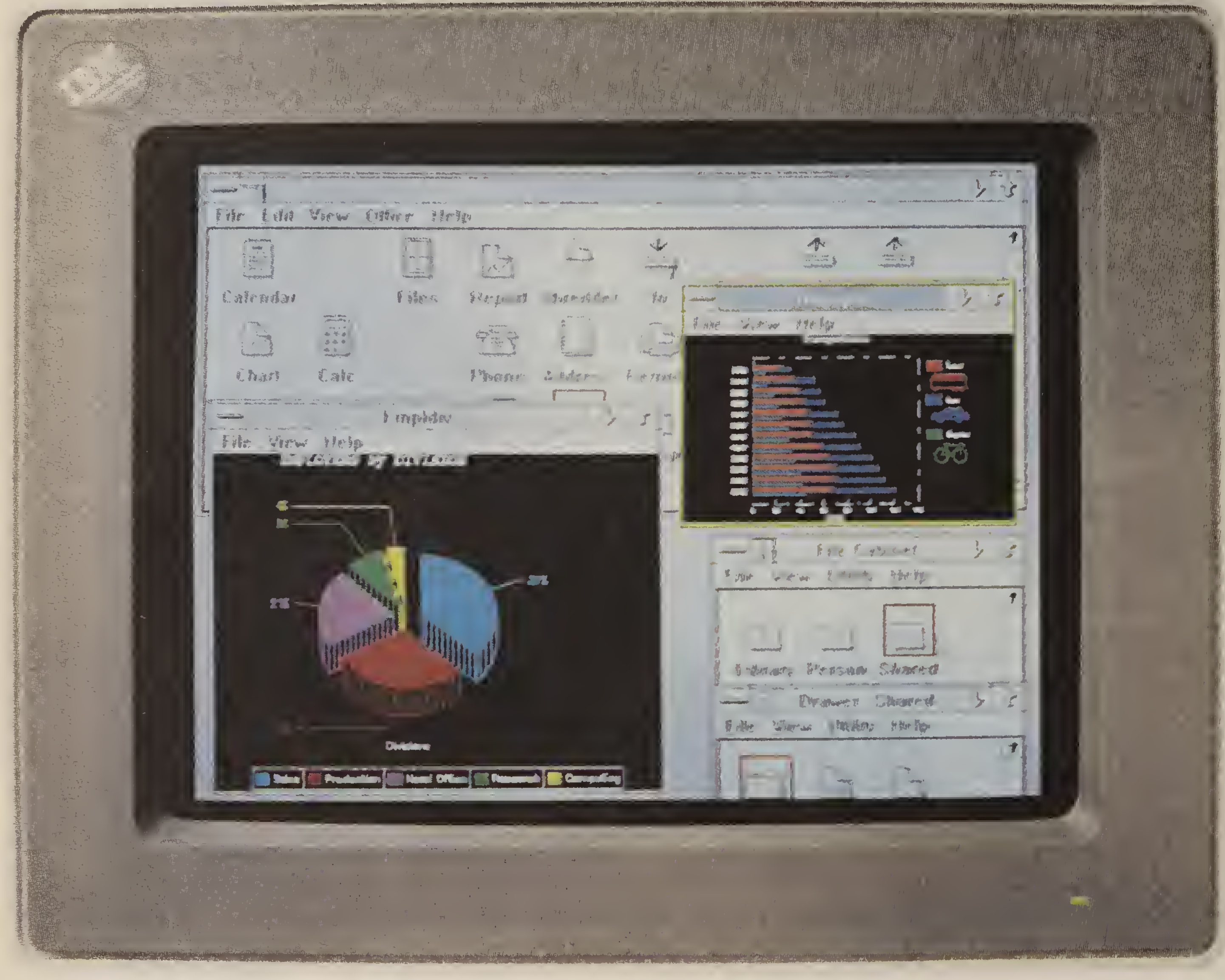
Adamson *takes the helm at ASM*

Adamson has been active within ASM at the chapter, division and international level and was international president in 1987-88.

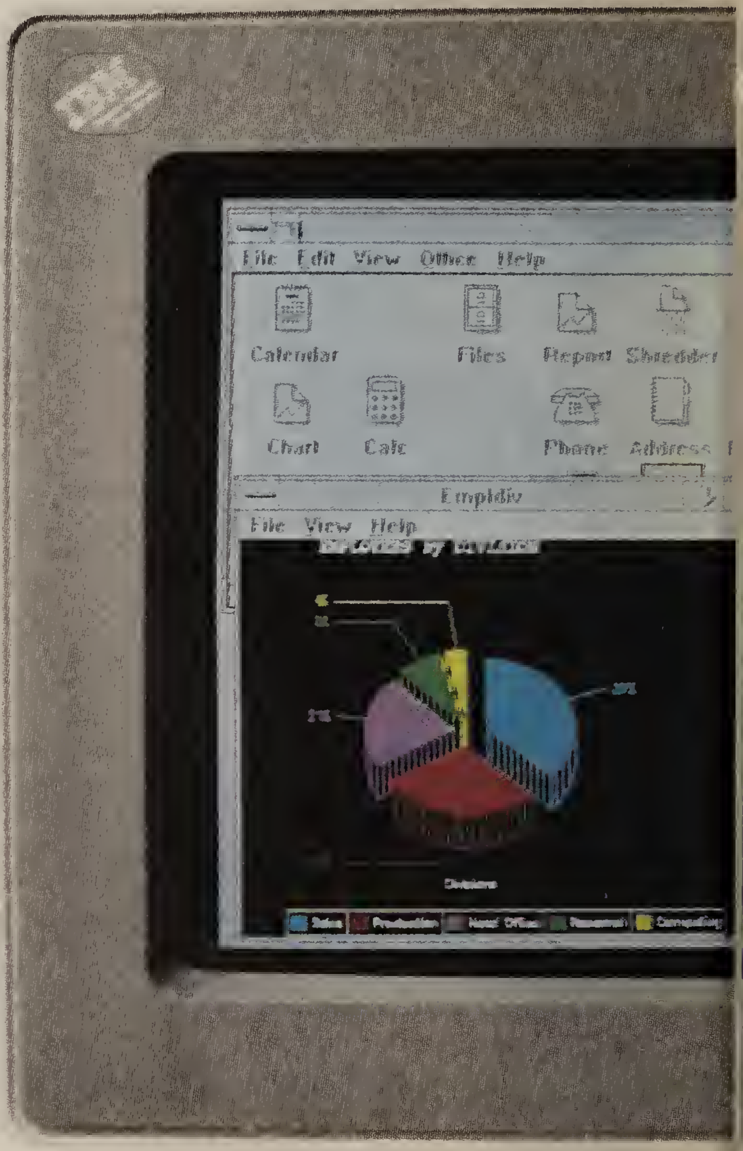
He has held IS management positions at Bank of New England, Pet, Inc. and Mars, Inc. before becoming a consultant in Los Angeles with Gottfried Consultants and Coopers & Lybrand.

Adamson says he feels he is up to all of his new challenges, with one possible exception. "Can someone who spent 20 years in Southern California make the transition to Cleveland?" he wonders. "The answer, here in mid-January, is — maybe."

Introducing IB



*On a LAN.**



On a mainframe.

The big difference is the

OfficeVision is IBM's first SAA application.

It will run on three different kinds of IBM systems: LANs, midrange computers and mainframes. It will work under four different IBM operating systems: OS/2,™ OS/400,™ VM and MVS. It will tie together a variety of different applications.

But to OfficeVision users, these kinds of differences won't make much difference. In fact, they'll hardly be noticed.

That's because, at workstations running OS/2 EE, OfficeVision looks the same across all of its environments. So anyone comfortable on one operating system can feel at home on another.

Better still, the way it looks and works offers powerful advantages.

Even if you're delighted with your present office software, you should know what OfficeVision (and SAA™) can bring to your future.

Software that makes other software work better.

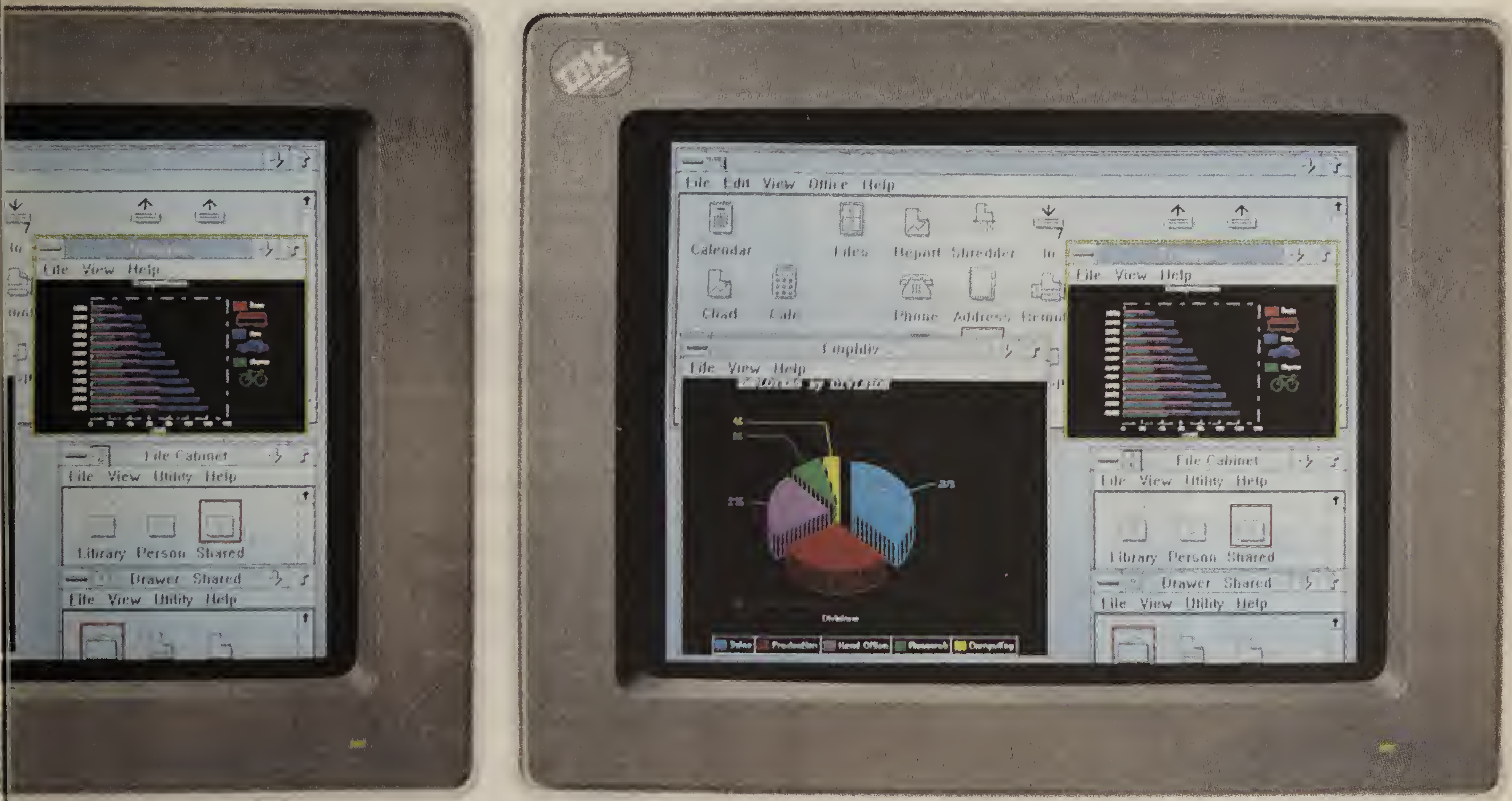
For starters, OfficeVision will give you an arsenal of basic office tools: E-mail, word processor, calendar, address book, phone dialer, etc. Users can arrange them on a screen as if the screen were an ordinary desktop. (Except that ordinary desks don't have icons, mice or windows.)

But what makes OfficeVision truly unique is the way it can "supercharge" a workstation (and thereby a worker) by combining systems and software resources from all around your company. Especially at workstations powered by OS/2 EE.

For example, in the middle of an OfficeVision screen, you'll be able to "snap in" PC applications like Lotus 1-2-3® or Microsoft Excel® while, at the

*Displays shown here are IBM PS/2s running OS/2 EE.

M OfficeVision.



On a midrange system.

re's almost no difference.

same time, you can run larger business applications on host computers.

What's more, programs written for Presentation Manager™ can be loaded into their own OfficeVision windows. Which means not only can you see several such programs at the same time, you can often swap information from one window to another. (See box.)

Now writing software for IBM OfficeVision:
American Management Systems, Inc.
Comshare, Inc.
Integral Systems, Inc.
Lotus Development Corporation
McCormack & Dodge
Microsoft Corporation
Tesseract Corporation

And thanks to OfficeVision's SAA interface, technicalities that sometimes mystify users (like communications, multitasking and cooperative processing) become much easier to deal with.

You should also know that OfficeVision has been designed to work with your previous investments. It will accommodate DOS workstations and non-programmable terminals, and you can install OfficeVision on an as-needed basis.

OfficeVision is available now.

OfficeVision/2 Release 1.0, for LANs, is now available and can be connected to currently installed AS/400,™ MVS, and VM systems. OfficeVision/MVS Release 1.0 is also available now.

OfficeVision Release 2.0 will be ready next Spring. With versions for OS/2 EE, OS/400, VM and MVS, it will be OfficeVision at full power, bringing with it the systemwide benefits of SAA.

Clearly, the place to begin is with OfficeVision Release 1.0. And the time to do it is now.

To learn more about OfficeVision, call your IBM Marketing Representative right away.

IBM®

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CALENDAR

Last year's natural disasters — the hurricane that hit the Carolinas and the San Francisco Bay Area earthquake — had corporate executives everywhere asking their data center managers if their companies had contingency plans to cope with similar problems.

For companies that have no concrete contingency plans, or those which are unsure if their plans are good enough, a "Corporate Contingency Planning Seminar & Exhibition" will be held March 5-7 in Palm Springs, Calif.

The conference, sponsored by *The Disaster Recovery Journal,* SRI International and the Association of Contingency Planners (ACP), will feature speakers from Comdisco Recovery Services, Inc., the New York Stock Exchange, Deloitte Haskins & Sells, Charles Schwab and the San Francisco chapter of the ACP.

Among the topics that will be addressed are corporate disaster recovery planning, how corporations survived Hurricane Hugo and the San Francisco earthquake, new features in electronic vaulting and testing your backup site under fire. For more information, contact the conference registrar, c/o *The Disaster Recovery Journal,* St. Louis, Mo. (314) 846-1001.

JAN. 28-FEB. 3

Developing Ada Systems. Los Angeles, Jan. 31-Feb. 2 — Contact: TTC Seminars, Torrance, Calif. (213) 534-3922.

Association for Educational Communications and Technology. Anaheim, Calif., Jan. 31-Feb. 4 — Contact: Association for Educational Communications and Technology, Washington, D.C. (202) 466-4780.

Uninterrupted Uptime Users Group Meeting. New York, Feb. 1 — Contact: Kenneth Brill, Computersite Engineering, Danvers, Mass. (508) 750-6700.

Infocomm International. Anaheim, Calif., Feb. 1-3 — Contact: The International Communications Industries Association, Fairfax, Va. (703) 273-7200.

FEB. 4-10

Information Strategies and the Bottom Line. Laguna Niguel, Calif., Feb. 4-6 — Contact: CIO Magazine, Framingham, Mass. (508) 872-8200.

Telecom '90. Orlando, Fla., Feb. 4-7 — Contact: American Bankers Association, Washington, D.C. (202) 663-5430.

Communication Networks Conference and Exposition. Washington, D.C., Feb. 5-8 — Contact: IDG Conference Management Group, Framingham, Mass. (800) 225-4698.

Systems 3X/400 Expo: Midrange Vendor Conference. Anaheim, Calif., Feb. 10-11 — Contact: National Productions, Salem, Mass. (508) 745-6010.

FEB. 11-17

Networld '90. Boston, Feb. 12-15 — Contact: H.A. Bruno, Englewood Cliffs, N.J. (201) 569-8542.

National Conference on Software Development. Washington, D.C., Feb. 13-15 — Contact: Conference Manager, U.S. Professional Development, Silver Spring, Md. (301) 445-4400.

Buscon '90 West. Long Beach, Calif., Feb. 13-16 — Contact: CMC, Norwalk, Conn. (203) 852-0500.

EDI Conference. Arlington, Va., Feb. 14-15 — Contact: Phillips Publishing, Potomac, Md. (800) 722-9120.

Motivating and Managing Computer Personnel. San Francisco, Feb. 14-15 — Contact: The Institute for Computer Capacity Management, Milpitas, Calif. (408) 954-0114.

Strategic Planning for Information and Systems. Houston, Feb. 14-16 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Association for Computing Machinery Sigforth '90 Workshop on Real-Time Software Development. Dallas, Feb. 16-18 — Contact: ACM, Howard Harkness, Bedford, Texas (214) 580-1515.

FEB. 18-24

ACM Computer Science Conference. Washington, D.C., Feb. 19-22 — Contact: The Association for Computing Machinery, New York, N.Y. (212) 869-7440.

Healthcare Information and Management Systems Conference and Exhibition. Chicago, Feb. 19-22 — Contact: American Hospital Association, Chicago, Ill. (312) 280-6168.

Electronic Data Interchange Seminar. New Orleans, Feb. 20-21 — Contact: Kari Pike, Washington, D.C. (202) 887-1375.

Computer Aided Multimedia and Presentations Show (CAMMP). New York, Feb. 20-22 — Contact: Barbara Stockwell, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

Electronic Imaging '90. Washington, D.C., Feb. 20-22 — Contact: U.S. Professional Development Institute, Silver Spring, Md. (301) 445-4400.

MMA joins with other PC group

NEW YORK — The Microcomputer Managers Association (MMA) recently merged with a smaller personal computer managers group, creating an association of about 600 members.

The 400 members of the MMA will join 200 members of the Information Center Managers Association of New York (IC-MANY) to form the new organization, which will still be known as the MMA. The groups held their first joint meeting last week. Both groups are nonprofit organizations.

IC-MANY was founded in 1985 to focus on the challenges of managing end-user support groups in New York-based corporations. The MMA was formed in 1982 and has taken a stronger advocacy role on specific issues of concern to PC managers, such as software site licensing and microcomputer technology standards. The MMA sponsored the recently formed 486 Standardization Committee.

(A) WY-3225, 25 MHz 386 as multi-user platform driving (B) WY-60 terminal, (C) WY-150 terminal and (D) WY-370 color terminal. (E) WY-3225 as LAN fileserver with (F) WY-2116 16 MHz 286 with WY-650 VGA color monitor, (G) WY-2112 12.5 MHz 286 with WY-700 hi-res monitor, (H) the Wyse Networker and (I) WY-3216 16 MHz 386 with (J) WY-7190 hi-res 19" monitor.

The strength of a

Winning players usually have a system. Which means Wyse is way ahead of the game. Because we have a full range of systems.

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Wyse systems make for smart solutions. Because all Wyse components are designed for full compatibility and ease of connectivity with each other.

BOOK REVIEW

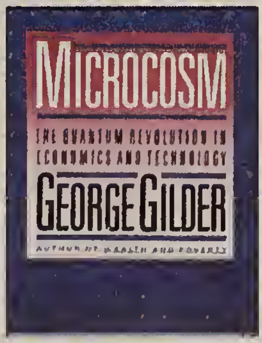
The microcosm is the message, or salvation through technology

MICROCOSM
By George Gilder
Simon and Schuster, $19.95

Technology and ideology mix about as well as oil and water. So when George Gilder set out to write a book blending the story of the microchip with his conservative political ideas, he doomed what otherwise might have been an intriguing account of technological innovation.

Microcosm starts out promisingly with a thoroughly researched history of microelectronics. Writing clearly about complex technical topics, Gilder enlivens his subject with colorful anecdotes of the people involved in placing silicon chips at the heart of the global economy.

But as the book unfolds, Gilder's political agenda looms larger than the rest of the story. He becomes increasingly preachy until, while referring to the microcosm as a "redemptive cross at the heart of light," he is seized by a fit of techno-evangelism.


MICROCOSM
THE QUANTUM REVOLUTION IN ECONOMICS AND TECHNOLOGY
GEORGE GILDER
AUTHOR OF WEALTH AND POVERTY

Gilder begins by heralding no less than the "overthrow of matter" in technology, business organizations and geopolitics. Instigating the revolution is the subatomic universe of quantum physics, the "invisible domain" of information-carrying electrons coursing through computers, televisions and brains.

"The move from macrocosm to microcosm," Gilder writes, "can be seen as a progress from a material world composed of blank and inert particles to a radiant domain rich with sparks of informative energy."

The microchip, he explains, epitomizes this revolution more than any other invention because of its high intellectual content. Made of cheap, ubiquitous materials, most of its value comes from its design.

Increasing miniaturization makes chips cheaper, cooler, faster, more effective and more reliable. As chip technology advances, he argues, the global balance of power can only tip further in favor of free-market economies driven by the ideas of innovators unfettered by government policy-makers.

Like earlier Gilder works, *Microcosm* is a rapturous ode to entrepreneurship. His heroes are mostly Silicon Valley denizens who parlayed venture capital and their ideas into successful products and great personal wealth. Although he glorifies them as prophets, his cast of characters sometimes seem more like narcissistic marketeers and idiosyncratic geeks.

His hokiest descriptions are reserved for Advanced Micro Devices, Inc. Chairman Jerry Sanders. According to Gilder, the years have saddled Sanders with "all the exquisite traps in the trappings of wealth, power, hedonism, hard work, relentless demands." Success is a bitch.

In a bombastic style that never shies from hyperbole, Gilder repeatedly attempts to use the internal structure of the silicon chip to support a deterministic defense of his supply-side economic views.

He rails against "intellectuals" and "leftists" who call for government intervention and paint dire pictures of declining U.S. competitiveness and technological prowess. He dismisses the arguments of Harvard's Robert Reich and MIT's Lester Thurow as "a revolt against the microcosm," as if they were guilty of acts against nature.

Gilder asserts his adversaries are fighting a losing battle because "the laws of the microcosm are so powerful and fundamental that they restructure nearly everything else around them." He believes, of course, that the system that accords best with those laws is one that embraces the laissez-faire policies he favors.

But technology is much more tolerant of differing ideologies than Gilder would have us believe. Computers and the chips around which they are built do not determine the nature of political and economic systems any more than they do the organization of the companies in which they are used.

In the book's final pages, Gilder transforms from political advocate to religious preacher, imputing to silicon technology the power to lift our lives spiritually. "The microcosm epitomizes the longer horizons and altruistic rules of the life in the image of the Creator," he writes.

By the end of the book, his sermonizing takes on a born-again tone, with his techno-theological blatherings reaching a paroxysm in the final pages. "In this unifying search [into the microcosm]," he writes, "is the secret of reconciliation of science with religion. The quantum vision finds at the very foundations of the material world a cross of light."

Unfortunately, *Microcosm* offers few insights into the obstacles that slow the innovative use of technology by business and industry. While offering an erudite and enthusiastic summary of chip history, Gilder pays little more than lip service to the need to tailor technological solutions to the needs of users.

AMIEL KORNEL

Kornel is a *Computerworld* senior editor, features.

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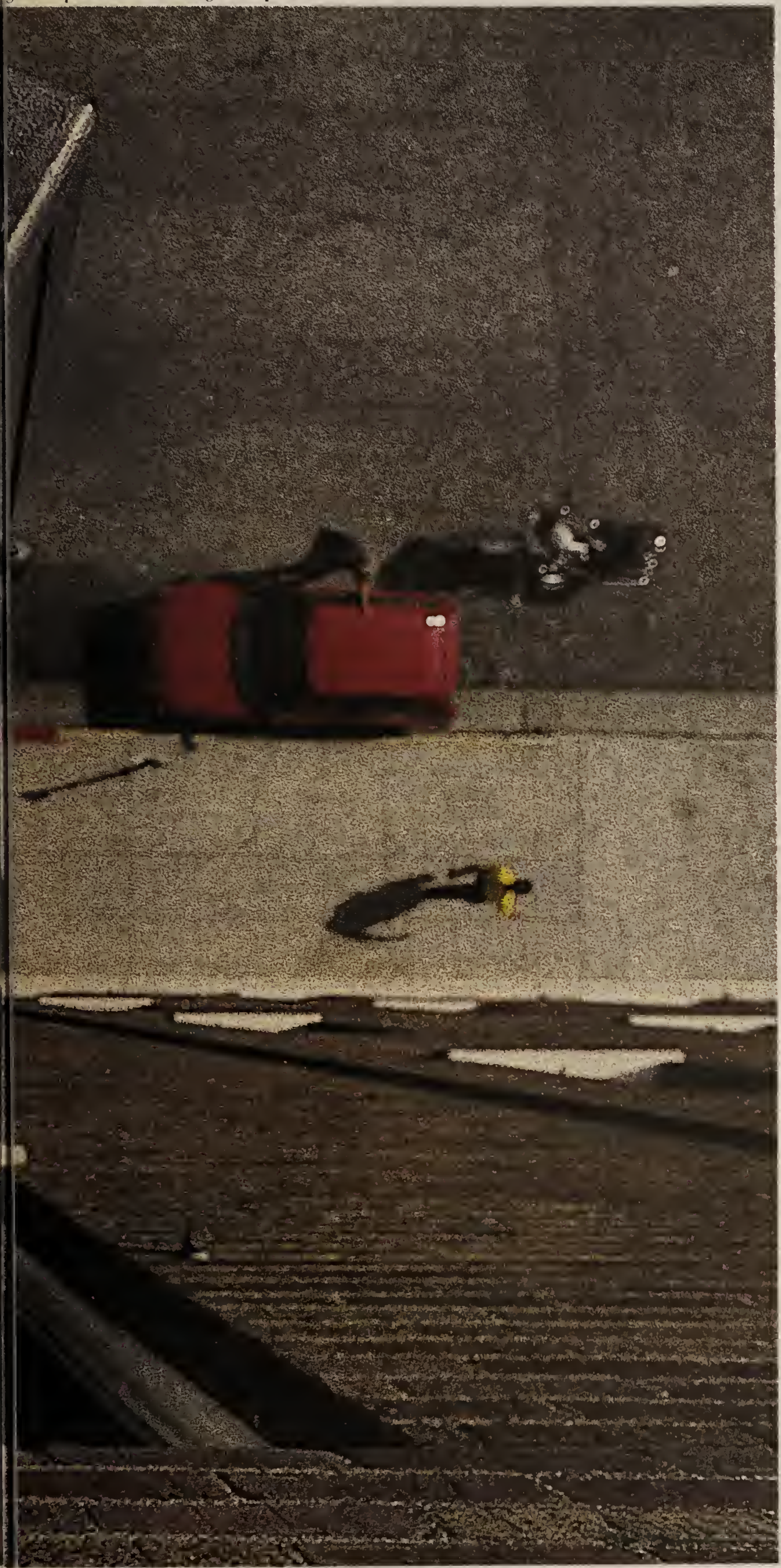
a database that's le

gres Corporation. © 1989 Ingres Corp.



The fate of an organization hangs on the strategic information in its databases. So the last thing you need in a relational database is a weak link.

Which is why you should consider Ingres.

Unlike databases that are strong in one area at the expense of the others, Ingres is a database of many strengths.

Foremost, Ingres is the first intelligent database. It combines a business rule system with user-defined datatypes and functions. Which means that like no other database in existence, you can actually customize it to model your business. All without sacrificing OLTP performance.

What's more, Ingres's application development tools are fully integrated, more complete and incorporate a full-function 4GL. Which means you can prototype, deploy and maintain complex applications more easily, efficiently and with complete portability.

Not to mention the fact that Ingres gives you transparent access to your data—even in non-relational databases.

So before you bet your business, look closely at the benefits and functionality of our product versus the others.

You'll learn that for empty promises and misleading tech-talk there are plenty of software companies you can call. But for a more intelligent alternative, there's only one.

The number is 1-800-4-INGRES.

Ingres

Intelligent database. Intelligent decision.

et your business on ss than the best?

Forrester

FROM PAGE 55

bility of the airplane represented by the model built before the airplane existed.

So I undertook the project of building an analog computer. We worked about a year on it, and I came to the conclusion that an analog computer of that complexity would probably never work.

So you turned to digital computers?
We spent about a year on a serial computer. At that stage, the design of a computer was dominated almost entirely by the kind of internal storage that one chose to work with. Some people were using mercury delay lines as storage, but they were inherently slow. We went the route of electrostatic storage tubes.

Were these the seeds of the development of core memory?
Yes. There was a background of inadequate memory. The electrostatic storage tubes did work but were extremely impractical. We were keeping a computer running with storage tubes that cost about a thousand dollars to make, stored a thousand binary bits, not bytes, and would last about a month. We were paying one dollar per binary bit per month to maintain storage. If you think of 8M bytes, which is 64M bits in a modern desktop computer, you would be paying the equivalent of $64 million a month to maintain the storage.

How did you come up with core memory?
It was a pretty clear case of necessity being the mother of invention. Because here I had a program, a reputation, a group, a vision that clearly wasn't going to be pulled off with the storage that we had. Everything depended on doing something about the high-speed internal storage.

I made the observation that there was linear storage, like the mercury delay line, and there was two-dimensional storage, like on the face of a CRT. So why shouldn't there be three-dimensional storage so you could pack it all into a solid cube and have more storage in less space?

In 1949, I was reading the monthly issue of the old *Electrical Engineering* magazine and came upon an ad for Deltamax, a rectangular hysteresis loop material that was being sold for magnetic amplifiers. My immediate reaction was, there is a nonlinear element, how could we use it?

I grew up on a cattle ranch in Nebraska, and we were out there for vacation in June and it was while riding horseback in the open spaces that I began to see how to make the solid three-dimensional array, using the same elements.

How long did all this take?
The work was done from 1949 to 1953. The magnetic core storage was put in and ran in the spring of 1953. By the summer of that year we had retired the electrostatic tubes in Whirlwind.

You patented this device.
Yes, with all the trauma of dealing with patents. It took us about seven years to convince the industry that this was a good idea and ought to be used in computers. It took the next seven years to convince them they had all not thought of it first.

What was the prevailing feeling then about computers?
There was great excitement, belief, dedication in what we were doing among the people working on it. Outside of the inner circle, there was almost no interest at all, within MIT or outside. The mathematics department would aggressively advise its doctoral students to have nothing to do with it at the threat of their future reputations and careers.

A distant mirror

When Jay Forrester left behind a brilliant legacy in technology development in 1956 to become a professor at MIT's Sloan School of Management, he did so because he believed he could marry the dynamics of technology with organizational structures. A quarter-century ago, Forrester expressed thoughts on that subject that ring remarkably true in today's corporate information systems world. The following is an excerpt from a paper written in 1965 entitled "A New Corporate Design."

Vast amounts of electronic communication and computer equipment have already been installed for business data processing. Yet, the equipment is used almost entirely for tasks of the type that were previously done manually. Emphasis has been on doing more data processing within the earlier patterns or on reducing the cost of work already being done.

The inadequacy of today's data processing objectives is exposed by industrial dynamics studies of corporate systems that show how behavior depends heavily on classes of information channels and decisions that are not today being supported by the electronic equipment. In these more important channels, information flow is haphazard, information is late, information is biased by human filtering and error is frequent. Computers provide the incentive to explore the fundamental relationship between information and corporate success.

On-line use of computers for both data processing and internal communication can provide an information picture that is up to date and fully processed at all times.

With such a restructured system, information will be directly accessible to persons that now must operate with too little information either to permit good management or to establish a feeling of security and confidence. If the internal information can be reduced, energy can be turned to the even more challenging quest for external information — information about new technical developments, new management methods, new employees, customer satisfaction, product performance in the field and changing markets.

The entire paper can be found in the Collected Papers of Jay W. Forrester from the Productivity Press in Cambridge, Mass.

Ken Olsen, one of your proteges on Whirlwind, will often start off a speech about how the vision of DEC's interactive computing came from MIT. Was this your vision?
It was my vision. It was Robert Everett's vision. We talked about time-sharing machines, people using a single machine by teletype connections from remote places. The Whirlwind had the first CRTs driven by computer. It could make plots and graphs on the screen. It was the first time you could put a light pen up to a CRT and tell the computer, "This is what I want you to do."

How important was Whirlwind as a breakthrough to the future of computing?
It would be fair to say that it had more things in it that persisted in the industry than any other single machine. It was a parallel machine; it was a synchronous, clock-driven machine. All of the early storage systems went by the boards when magnetic core memory became available. Core memory was the memory of all digital computers for a period of 15 years or so, until the solid-state physics memories came along.

Whirlwind had very high reliability, probably higher reliability than most of today's machines. It led into the SAGE Air Defense computers. Those were installed in the late 1950s. The last one was decommissioned in 1983. They operated for almost 25 years. The historical records of those centers show 99.8% uptime. I'm not sure you can get that out of very many of today's computers.

You did all these amazing things with computing and then in 1956, you left it all behind for an academic post in the management school. Why?
First of all, in 1956, I sincerely felt the pioneering days of computers were over, which may be hard for your readers to imagine. But the fact is that in the decade from 1946-56, the ratio by which computers improved — the increase in speed, internal storage, reliability, if you multiply those together — was a bigger multiple improvement in the field then in any decade since.

More importantly, I had come to realize that success in technology is more a result of the managerial and cultural environment than it is the technology. Whirlwind and the SAGE Air Defense system succeeded to the substantial extent they did only partly from the technology. They succeeded because of the management that went with them.

Explain.
Anyplace you find highly reliable equipment, you look behind the scenes and you find there is a culture and probably a person who is absolutely dedicated to doing the job right. And if you have that dedication, the job can be done right and is done right. When you get the dedication to reliability, you find it does not necessarily cost more or take more time.

How did you end up at the Sloan School?
The only thing I could consistently claim was an openness to opportunity, or the willingness to walk through an open door. That really was the reason for coming to the Sloan School.

I was walking down the hall with MIT President Jim Killian in the early 1950s. He said that MIT was starting a new management school and there might be something interesting there and I should look into it. I came with the idea of seeing what the technology side of MIT had to contribute to a management school.

I spent my first year at the Sloan School trying to decide why I was there.

What led you to industrial dynamics?
It was out of discussion with people from GE who were puzzled as to why their household appliance factory in Kentucky was running overtime one year and half the people were laid off three years later. It was easy enough to blame it on the business cycle, but they weren't quite convinced that that was an adequate explanation. I began to look into this and see that you could get this large fluctuation of production that they were experiencing even if you had absolutely constant demand.

This was the beginning of what became industrial dynamics and what is now known as the field of system dynamics. System dynamics shows how structure and policies determine the behavior of systems, like corporations. These dynamics produce the successes and failures that organizations usually tend to attribute to the outside world. In fact, it is the internal structure and the internal decisions that are primarily the answer to what's going on.

What was in the model you developed?
It turned out that very few tangible variables like number of employees, inventories, backlogs or machinery were critical. More important are the more subtle intangibles like information flows, how information is interpreted, how the goals and traditions of a company get formed, how its own past determines its future decision-making, how its traditions determine future decision-making processes. Above all, how the attitudes, integrity and vision of the managers dominated.

There were some insights about why the Route 128 companies were reaching a case of stagnation, and now you see that exactly these same reasons are at the bottom of why many American companies have lost their markets to Japan.

How so?
American companies have essentially given away their markets by not fulfilling them themselves. One thing we found was that the driving belief that the market responds primarily to price is basically wrong except in things that are absolutely commodities. You find that American companies have for a long time believed the foreigners were coming in because they had lower cost production and prices.

As you look back on your career, what would you like to be remembered for?
What I've been doing for the last 30 years on the dynamics of corporate and social systems is far more important than anything I did in computers. System dynamics is a pioneering field. It is going to be adopted more slowly because it does hit squarely at how people run their businesses. So it is not easy for them to accept the idea that a lot of their problems are of their own making. But it is a frontier for the next 50 years at least. I would like to be remembered as having a major hand in opening up that frontier.

EXECUTIVE REPORT

WHAT IS BRINGS TO THE FOOD CYCLE

From grower to grocer, systems are taking root

BY HELEN PIKE

As manager of consumer and trade affairs for Del Monte Foods USA, Kathy Randle gets a lot of letters and phone calls — as many as 50,000 per year — from consumers of the company's products. A letter she calls a "Del Monte classic" recently came from a 13-year-old girl in Oakland, Calif.:

There's a problem at my house. I have three brothers and sisters, and we always fight for the cherries. I wish you could put as many cherries in your fruit cocktail as you do other fruits.

Randle receives a lot of correspondence regarding those cherry halves, usually from people who feel there aren't enough of them. However, she also receives letters and phone calls about other things, such as pit pieces in cans of peaches or the lack of Del Monte products in a local supermarket.

These customer contacts are important, Randle says. They not only help Del Monte turn out consistent, quality products by alerting the company when something goes out of kilter somewhere in its complex operation, but they can also serve as a source of new product ideas. For example, customer input led the company to introduce low-salt and low-sugar versions of a number of products beginning in the late 1970s.

The primary tool that Del Monte uses to cull critical pieces of information from the huge crop of consumer questions and suggestions is a turnkey information system called the Consumer Response System (CRS) from Wilke/Thornton, Inc. in Worthington, Ohio.

CRS, which employs a Wang Laboratories, Inc. VS 75E as its engine, does double duty as a word and data processing system. While the San Francisco-based company is printing out response letters, it is simultaneously extracting data from customer letters and funneling the information into a database that monitors the relationship between consumer feedback and product quality.

CINDY CHARLES

Sidney Daniel *at Del Monte pushes computer use companywide, even out to the canneries*

Each month, the consumer affairs office downloads the data from that database onto personal computer disks and sends them to other departments. Quality assurance gets one. So do research and development, marketing and operations — including the canneries, which have direct contact with growers.

This feedback system, which has been in place at Del Monte since 1983, is part of a companywide effort to identify consumer issues in a more rational way, according to Sidney Daniel, R&D and quality assurance systems manager. Daniel, who promoted PCs throughout the company as a platform for product-by-product analysis using Ashton-Tate Corp.'s Dbase, Lotus Development Corp.'s 1-2-3 and a statistical quality control software package from Northwest Analytical, Inc., says the task of constructing the information distribution loop was in itself an education in process interrelationships: "You learn how all these management systems tie together and have an impact on product quality."

Del Monte holds no patent on the discovery that IS can be a potent enhancement to the food industry. Up and down the food chain — from the growers who sow the seeds to the supermarket retailers who sell the food products — more and more systems are at work controlling, collecting and corroborating data that helps put food on America's tables.

IS has been gradually making its way into the food industry since the 1970s, when supermarkets began installing scanners at the checkout line. Food processors are among the more recent converts to automation as hardware prices come down and software applications specific to niche functions are developed.

A new definition

According to Willard Bishop, president of the mass-merchandising consultancy in Barrington, Ill., that bears his name, IS is the mechanism by which the U.S. food industry will redefine itself.

"All companies are using some form of IS to influence time, form and placement of a product," Bishop observes. "We are only beginning to see glimpses of where IS is making contributions."

There are three main factors feeding the current IS activity at various levels of the food cycle:

- The PC proliferation of the late 1970s and early 1980s, which began by automating many manual accounting practices at food production and marketing companies and has now moved into the processing plants and onto the farms.
- The food industry's mergers and acquisitions binge of the last decade, which prompted many companies to examine computers for ways to gain economies of scale in areas of the industry that are high-volume but low-margin.
- The profusion of industry-specific software, much of it PC-based, which allows methods of data collection and analysis never before possible.

Since 1982, Paul Yarborough, communications professor at Cornell University in Ithaca, N.Y., has tracked the rate at which New York and Iowa farmers install computers. Eight years ago, the rate was 2%; in the January-February period of 1989, the rate was up to 15%, with 10% attributable to farmers using computers for records management.

"One of the major impacts of

INSIDE

Polishing the delivery
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Checkout news that isn't in the tabloids
Page 71.

Pike is a former senior writer for *Computerworld*.

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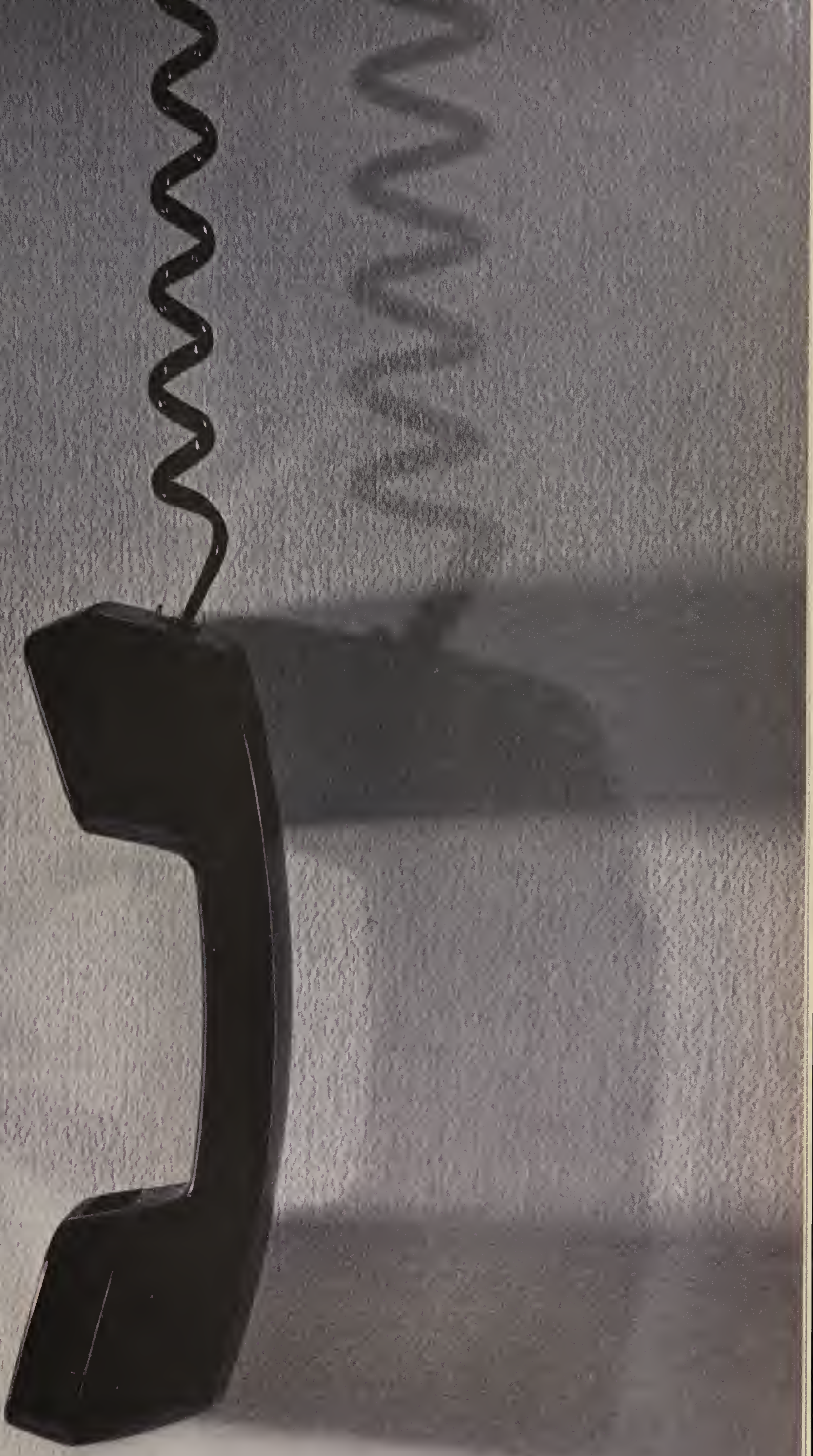

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Taking root

FROM PAGE 63

computers," Yarborough says, "is that farmers can more easily keep more complex records." As in other industries, that is called enterprise accounting, and for farmers it means "it's the only way they can attach a cost to what they're doing," he points out.

The computer of choice for farmers is an Apple Computer, Inc. Macintosh or Apple II or an IBM Personal Computer or compatible, with more farmers owning an IBM or clone than any other desktop computer.

Many farmers use modems (or satellite dishes or radio receivers) and, via electronic mail accounts, tap into on-line databases maintained by either university agricultural extensions or farm bureaus to get data on weather predictions, pest migration patterns, the latest commodity prices, labor lists and even dates for computer tutorials.

In California, where the word "farming" translates more as "agribusiness," growers have to keep as close a watch on regulations as they do on their crops. "We have the most regulated farming industry in the world," says Royce Goertzen, ticking off labor laws, immigration laws, payroll forms, chemical and fertilizer limits.

Goertzen used to manage a ranch. Today, he is technical manager for Agriconcepts in Reedley, Calif., a farm management firm that oversees 6,000 acres of fertile citrus, grape and fruit tree acreage in central California's San Joaquin Valley, including a block of peaches sold annually to Del Monte.

Agriconcepts uses an IBM System/36 to do payroll and budgets and a Personal System/2 for spreadsheets and word processing.

"We've been computer-oriented for five to seven years," Goertzen says, estimating that one in every four growers uses some kind of computer to do payroll and run some kind of standard accounting software package.

Goertzen says he is waiting for the day when the price of handheld computers will come down so he can spend less than six hours a day at the computer and more hours a day actually walking the fields.

A penny saved . . .

Although Agriconcepts cannot put a total dollar value on how much its systems are directly saving the company, Goertzen says there is one area in which the IS cost benefit is clear and measurable, and that is in savings on liability insurance.

In much the same way medical prescriptions work, Agriconcepts is licensed by the state of California to write recommendations for pest control dosages on the farmland it manages. California growers can pay between $10,000 and $15,000 annually for what amounts to malpractice insurance.

However, they can net a 15% discount if they use Advanced Consultant Service, a Unix software package put out by Crop Data Management Systems, Inc. in Marysville, Calif., and recognized by insurance companies for its statistical accuracy in tracking pesticide labels.

Government agencies and insurers are not the only groups interested in records of pesticide use. Many food processors are requiring their raw material suppliers to furnish data as a prerequisite for doing business. At its canneries, Del Monte has begun requiring growers to furnish data on their pesticide use, imposing even stricter limits than those set down by the state. The data is statistical proof on the quality of growers' produce. It's what Thomas White calls "making them do the math."

Agriconcepts' Goertzen

White is president of Thomas International Corp., a consultancy in Reno, Nev., that implements quality and statistical process control systems. Clients such as General Mills, Inc. and Hershey Foods Corp. insist that their almond suppliers furnish documents proving quality standards as part of their own efforts to cut down on redundancy and labor. Blue Diamond Almonds, another Thomas client, performs the necessary statistical analysis and supplies the resulting data.

"It reduces outgoing and incoming inspections," White says, pointing out that much of food processing and manufacturing is still very labor-intensive, with "armies of people with clipboards taking down data on slips of paper."

According to White, during the 1980s the food industry noticed that Detroit auto makers were trying to find objective and quantifiable solutions to their manufacturing problems — "that they were trying to get a handle on the variables [because] the more consistent product means more money."

In the food processing industry, the variables IS helps control include the following:

- The weight of canned goods. Besides complying with federally set limits, properly weighted cans lower trucking fees for moving finished foodstuffs from plants to warehouses or distribution centers. Proper weight is crucial for cooking times, both in processing plants and in consumers' kitchens.
- The amount of fruit and vegetable pulp waste (sometimes as much as half of what winds up in a can winds up as waste). Cost savings affect rental rates for processing equipment such as peach pitters.
- Food texture and color. This applies to the right texture of peanut butter or even the color of chicken breasts.

The applications are limited only by imagination and available cash, White says. Even among the big food processors, operating budgets are often razor-thin, according to White, who favors Unix specifically because he feels it offers maximum flexibility at minimum cost. White says $25,000 to $125,000 can be spent to install a system.

A plant manager is not going to spend $200,000 to $300,000 to do it on a mainframe, agrees Gil Hilleary, especially if he only has $1 million for capital acquisition projects. Hilleary, who now works for a competing cannery, worked with a system installed by White at Del Monte's Stockton, Calif., cannery, where he was quality control manager.

The system, one of a number of product information management (PIM) systems that was contracted for by Daniel, runs off a PS/2 using Xenix, the Microsoft Corp. version of Unix for IBM PCs. PIM collects data related to the testing of products against specifications as they are processed and manufactured, whether the product is a can of fruit cocktail or a cup of vanilla pudding.

According to Hilleary, the system, which cost less than $50,000, replaced a 4-in. daily accumulation of paper at the cannery and gave a 60% return on investment through labor elimination.

More to it

Economy, although important, is not the whole story, however. The real value of PIM lies in the fact that it shifts the emphasis from spotting and fixing problems to improving the entire process.

"We wanted to put together a capsulated view of what kind of problems there are from the production and quality standpoint. We wanted to be able to present management with graphics and regression curves and get it to mean as much as we could," Hilleary recalls, referring to his collaboration with Daniel on the design of the system.

Hilleary was recently wooed away by a competitive canner, Colusa County Canning in Williams, Calif., a subsidiary of NAAS Foods, where he is drafting a budget for a computerized grading system for tomatoes that he hopes will be a type of front end for a PIM he would like to install at Colusa.

Regardless of the type of processed food, the next step on

Food services venture beyond vanilla systems

BY BARBARA RUDOLPH

Maybe you didn't savor the last meal you had on an airplane or in your company's cafeteria, but the food service industry is beefing up its strategic systems to get that food from the warehouse to your fork.

What probably stands out most about the $4 billion institutional food service industry is the number of very small companies that make it up. A few of these firms, sometimes operating out of a single warehouse, have sophisticated information systems in place; most depend on computers merely for basic nuts-and-bolts operations.

Except for the tiniest of these, though, the industry is realizing that to remain competitive in today's environment, it must look to strategic information systems.

"Each week that goes by, computerization is more widespread," says Gilbert Kretzer, vice-president and executive director of the International Food Service Distributors Association in Falls Church, Va. "Almost everyone is using it for inventory and billing. Some have more exotic systems. But one thing is for sure: Either they'll get into computing or they won't be around."

Laptop computer use by field salespeople is one area that is becoming quite common, especially among the larger companies, which make up 20% of the industry. J. P. Foodservice in Hanover, Md. — just formed in July from nine northern branch offices of PYA/Monarch Foods — is one such company.

"A sales rep at the customer site can input the desired items into an MSI terminal [a device a little larger than a handheld calculator that collects data and acts as a modem], which sends this information into the central computer," says Barry Felker, operation support supervisor of information services.

"The order is checked electronically against existing inventory codes. If the item is not available, the computer kicks into an autosubstitution system in which another brand of item is substituted for the one requested. Agreement on second and third choices for an item would have been previously specified by the client," Felker says.

In some cases, terminals are placed directly at the client site so they can "place an order directly, view J. P.'s stock, make selections or substitutions, recap their order and know what's coming," he adds.

Probably most important to this particular industry, however, is a truck routing system. "Unlike a wholesaler who has his whole order on one truck, ours have 15 to 20 [orders] in one load and spend a whole day delivering merchandise. This kind of system is currently not widespread, but it's gotten a lot of publicity and is growing rapidly," Kretzer says.

Truck routing is a major concern at the larger companies, but with the word "consolidation" buzzing around this volatile industry, more of the smaller firms may be looking into it as well.

One company with such a system in place is Kraft/S.S. Pierce, a division of Kraft Food Service in Peabody, Mass. Using commercial software from Roadnet Technologies in New Jersey, Kraft "geo-codes" its truck routes; that is, using road maps and customer location numbers, the software generates optimal truck routes. At the end of each day, billing, invoicing and location data is downloaded from the mainframe to PCs, which house Roadnet. Truck routes are established, and by 5:00 a.m. the next morning, the trucks are ready to roll.

One area ripe for development but "not even halfway home," according to Kretzer, is a universal bar coding system from manufacturer to distributor to customer.

The institutional food service industry is a long way from five-star status in its deployment of information systems, but a move is on. •

Rudolph is a free-lance writer based in Lexington, Mass.

the route to market is usually a warehouse or distribution center. Managing the stockpiles at this point is, as Del Monte's Daniel points out, a delicate science.

Because of the seasonal nature of crops and year-round demand, just-in-time management does not work for food processors, Daniel notes. Instead, she says, companies must tie up a significant amount of capital in inventory. Trying to keep investment at a reasonable level while accurately pacing supermarket deliveries and wrestling with the vagaries of Mother Nature can produce some major headaches.

The way Del Monte currently copes is by using an IBM 3090 running a proprietary, in-house application to manage 10 distribution centers that house inventory from 32 plants. This system will soon give way to another in-house one, however, which Daniel says will be PS/2-based and include capability for bar-code tracking of products.

To market

Food manufacturers are not the only companies using IS to keep closer track of inventory: supermarkets are, too. Many retail outlets have implemented on-line tracking applications that oversee buying, receiving, billing and shipping from different warehouses and different suppliers. However, their use of computers and communications does not stop there.

One Florida-based supermarket chain is using an IBM-based expert system for its retail Help desk. A chain in Southern California is trying out electronic shelf tags whose digitized numbers are changed daily using FM signals. More and more supermarkets are installing network-based electronic funds transfer systems in which the use of a plastic card automatically deducts the grocery bill from a customer's bank account.

The use of scanner technology, in fact, has transformed the relationship between food manufacturers and food retailers, according to Richard Norris, a consultant at Arthur D. Little, Inc. in Cambridge, Mass.

Del Monte
Quality

Supermarkets used to be forced into buying whatever wholesalers offered them, Norris says. The attitude on the part of the suppliers was "take it or leave it." Sometimes, he adds, even if the grocers took it, they would still be left high and dry as wholesalers broke agreements and deserted them for a better margin offer.

Now, however, the balance of power has shifted. With scanners at the checkout and computers in the back room, retailers are first in line to view all the crucial data related to consumer buying patterns. Now, when a food manufacturer's sales representative or brand manager visits, the data on what and how much a supermarket wants to buy is often already waiting for him in the lobby, Norris says.

Nancy Deyo, a one-time brand manager for Procter & Gamble Co., the consumer packaged-goods conglomerate, also notes the growing power of food retailers and the resulting pressure on food producers.

"It's dog-eat-dog out there. Brand managers have to go through a very data-driven process to prove themselves," says Deyo, now industry marketing manager at Metaphor Computer Systems Co. in Mountain View, Calif.

"Firms are bringing in technology because they don't have the luxury of making gut-level decisions anymore," Deyo says. "It's not just a marketing strategy anymore. IS makes an initiative happen. It means being part of a business team that includes sales, finance, market research and product development people."

> "IT'S DOG-EAT-DOG out there. Brand managers have to go through a very data-driven process to prove themselves."
>
> NANCY DEYO
> METAPHOR COMPUTER SYSTEMS

So now, brand managers look at data and ask themselves such questions as the following:

- What combination of internal and external data do I need?
- What insight do I need in any cut of data I take?
- What software tools do I use to gain a more unified approach to meeting corporate goals?

At Del Monte, brand managers use the Metaphor database to find meaningful patterns in reams of purchase data generated by supermarket scanners. When printed out on paper, the data can be measured in six-foot stacks. Computerization, says marketing systems manager Greta McKeon, reduces the job of digesting that mass to a manageable size.

"We've gone technical because of the enormous amounts of data that are generated on our products," she says. "To try and find out manually where a problem or an opportunity exists [was] very difficult.

"We use the system to do reactive marketing," McKeon continues, explaining by way of example that "if you're losing volume, you go back and rework your pricing strategy."

Ed Palmer works on the front lines of that process as sales technology manager at Del Monte. It is Palmer's job to figure out how to maximize profits at the supermarket level through adjustments of pricing and stock placement. In the course of that work, Palmer makes frequent forays to retailers around the country, carrying an MSI Portable Data Terminal Plus equipped with an electronic wand. His purpose is to record data on shelf sizes, Del Monte items on the shelves, their dimensions, how much of which products are sold per store per week and the product's retail value. He then goes to a telephone and transmits the data into a PS/2 in his office in San Francisco. All the data will be in there when he returns to perform what-ifs to reset the shelf based on dollar value, movement and profits.

This process, made possible in large part by the recent advances in data collection at the supermarket level, represents a major step toward active management of profitability. Until as recently as 1987, "we'd kind of guess at profits," Palmer explains. Now, working in partnership with retailers, he says, food producers can stop guessing and start acting on hard information. "We have our expertise within our own category, and retail has data on their activity. In partnership, we [make profits] together," Palmer says.

The kind of collaboration between producer and retailer that Palmer is talking about is what Arthur D. Little's Norris calls part of a "cultural tidal change in U.S. commerce.

"The Japanese have been teaching us some lessons. I mean things like joint vulnerability and working together to solve problems," Norris says.

Consultant Willard Bishop, a former executive director of the Food Marketing Institute in Washington, D.C., agrees.

"Cooperative partnerships make sense if you want to be more productive," Bishop says. "It's easy to embrace technology. But the food industry is a very large industry and one imbued with tradition. We'll need to make some major changes in organizational relationships in order to be more efficient with information technology."

With the help of information systems, companies are getting closer to their customers' needs and desires. Between 1985 and 1987, Del Monte reduced complaints by 46% on its vegetable products after Daniel and Hilleary, then both in operations, asked for consumer response data they could manipulate to find fault patterns that could be corrected at the operations level.

IS also helps food companies improve efficiency in handling consumer contacts. For example, Wilke/Thornton has incorporated imaging into its CRS product so that labels, ingredients and instructions can be called up on a screen while an employee talks to a customer or drafts a letter of response. Consumer affairs offices at food companies used to look like supermarket storerooms, with cans and boxes lining shelves and desks heaped with outdated product manuals. Consolidating all of that information in a database and making it accessible for screen viewing results in both a neater department and faster answers for customers.

Eventually, Randle and Daniel hope to install an imaging system that will directly transfer data from letters into the database and automatically generate responses. Until then, Randle contends with personalized form letters to respond to pleas for more cherry halves in Del Monte's fruit cocktail.

As it turns out, the amount of cherries in any given can of fruit cocktail is one of the few areas in the food industry where information systems cannot do much to help. Aside from an automated inspection process to guarantee that some cherry bits do get into each can, there is little that Del Monte can do to boost the number of cherry halves and still legally call the mixture fruit cocktail. As Randle explains in her consumer response letters, the Food and Drug Administration's Standards of Identity limit not only the amount of cherries according to weight — between 2% and 6% — but all of the other fruit bits in a formula decreed by law to constitute fruit cocktail. ●

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Fresh thinking in delivery systems

BY GARY ROBINS

Anyone who has ever reached to the back of the dairy case to get the freshest carton of milk appreciates the importance of prompt delivery of goods to the grocer. Moving any products from manufacturer to distributor to retailer is a complex process, but this is particularly true when you are transporting perishable commodities. Emerging electronic data interchange (EDI) technologies and standards, however, are helping to speed those shipments along.

EDI is no newcomer to the grocery industry. Uniform Communication Standard (UCS), the set of EDI message and communications standards for the grocery industry, was developed in the early 1980s and released for general use by late 1982. Another set of standards used in the food distribution chain, Warehouse Information Network Standard (WINS), has close ties to and became available shortly after UCS.

Recently, still another set of standards — direct-exchange uniform communication standard (DEX/UCS) has emerged to expedite the direct exchange of delivery data. By easing order taking, tracking and forecasting, these standards are helping at all stages of the food distribution chain.

It all begins at the manufacturing level. Land O'Lakes, Inc. reports that a significant portion of the orders it receives are UCS-based, although the company declines to specify the exact number. The $2 billion-per-year dairy cooperative maintains a competitive turnaround on orders. Part of the trick to the turnaround is to always have products in stock, and that is a function of the co-op's forecasting system.

Continental Freezers' Snodgrass

Land O'Lakes uses a statistical application that produces a 24-month forecast. After marketing and sales staffs manually input data from the national and district levels to adjust for promotions, the forecast is rerun before being fed into a distribution requirements planning (DRP) system.

This system identifies the inventory levels Land O'Lakes needs, based on the forecast as well as on service-level and inventory-investment parameters.

Both the forecasting and the DRP modules were developed by American Software, Inc. in Atlanta, but Land O'Lakes performed extensive internal modifications.

Inventory planners then fine-tune the inventory strategy based on the timing of promotions, and the planners constantly review the DRP system to make sure the inventory is in sync with demand. If it falls out of sync, the plan can be adjusted accordingly.

From the manufacturer, goods often pass through distribution centers. Continental Freezers of Illinois runs a public warehouse of approximately one million cubic feet in the Chicago area. A public warehouse acts as an agent for manufacturers and a holding area for distribution.

"For example," explains Ron Snodgrass, the company's information systems manager, "we have accounts with Pillsbury and Quaker. They will forward inventories out of manufacturing to Continental Freezers in the Midwest, and then Continental Freezers distributes to 14 states."

Continental's warehouse stocks only frozen food, which, while not as perishable as fresh products, poses a concern for rotating inventory to protect quality.

The firm uses an internally developed application to keep track of an inventory that includes 7,000 different items and manage the order in which those items go out the door. Each shipment is assigned a lot number that is recorded, along with the date of receipt from the manufacturer or the expiration date. When the products are moved to storage racks in the freezers, the rack number is also recorded. This is particularly important because similar items may not be stored near one another if adjacent shelves were already occupied at the time of arrival.

The main benefit of the software, however, is its ability to generate a priority list so that Continental is aware which products to ship first, according to whether the vendor prefers to fill orders on a first-in first-out basis or by production date.

Cutting edge

According to Snodgrass, who is the current chairman of the WINS industry committee, Continental has been involved with WINS since late 1984. The advantage, he explains, is standardization. With hard copy orders, Continental Freezers, which processes between 2,500 and 3,000 orders per week, is forced to interpret several hundred different formats.

The next step for the company is a project, already under way, to develop a means for carriers to share their information with Continental. "What I want to do is to hook into their systems so that they can notify me of where a truck is or when a shipment was delivered," Snodgrass says.

One trucking firm — independent of Continental Freezers — that is working to link with its clients is Denver-based Trans-Western Express Ltd. (TWX). Seventy-five percent of TWX's long-haul business is refrigerated loads. Each hour, TWX pinpoints the location of its trucks, which are linked to a satellite-based positioning system developed by Geostar Corp. in Washington, D.C.

According to TWX President Paul Amen, meat packers need to know by 7 a.m. every morning where their loads are and whether they will be delayed. A delay of only a few hours can eat into the entire profit of a load because market prices of beef are so volatile.

TWX truck locations currently are being telephoned or faxed to the meat packers, but the company is developing an EDI interface so that clients can hook into its system. "With an EDI interface," Amen says, "you could be in Chicago waiting for a TWX truck, and you could get into our computer and tell our computer that you want to know when that truck is exactly two hours from your dock. Two hours out, your computer will get a message telling [the truck's] location, rate of speed and estimated time of arrival."

Benefits, galore

The satellite linkage offers other benefits besides vehicle location. In October 1988, TWX piloted an application for haulers of refrigerated loads: a satellite-based system that transmits the temperature of the load back to a personal computer at headquarters. The trucking firm uses the system to ensure that the proper temperature has been maintained throughout the transport of the load.

Any failure of the cooling systems can be costly; for instance, a load of strawberries can be worth more than $40,000, Amen says.

Although such distribution arrangements through an agent can speed things along, many perishable and nonperishable items are delivered directly from the vendor to the back door of the retail grocer. This is called direct store delivery. Dairy products, baked goods and snack foods are just a few direct delivery products. While these items typically account for only about 25% of the dollar volume coming into a store, they generate a tidal wave of paper. In order to combat direct delivery inefficiencies, DEX/UCS was developed, a new weapon in the EDI arsenal for use on the receiving dock.

In direct exchange, a delivery person physically connects a handheld computer containing the delivery information to the store's PC or minicomputer. The delivery information in the handheld unit is downloaded to the store's machine. At the end of the delivery, an acknowledgment or an adjustment from the store is uploaded to the handheld computer. Both the delivery information and the acknowledgment are established UCS transaction sets. Direct exchange ensures the accuracy of shipments so that both vendor and retailer agree on the counts and pricing of items ordered.

Richard C. Norris, practice leader for EDI at Arthur D. Little, Inc. and who worked on the original UCS feasibility study completed in 1980 and on the DEX/UCS development effort, says that the standards allow for unattended data transfer so a driver can dump the delivery information without waiting for a store employee to prompt the system.

DEX/UCS is still in its very early stages, so there are few players at this point. But Ray Shei, senior manager of logistics at Keebler Co., which was a participant in one of the first live DEX/UCS transactions, is convinced that DEX/UCS will be a very important factor in the industry as more and more grocers implement direct store delivery systems. •

Robins is a free-lance writer based in Northfield, Minn.

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Shopping carts hold clues to marketing mysteries

BY DAVID LUDLUM

Money isn't the only critical commodity supermarkets are taking in at the checkout counter these days. Grocers are also using the point of sale to harvest an increasingly refined wealth of information on their sales and customers.

That data, some of which is bought and resold by information vendors, is of interest to food manufacturers as well as supermarket owners. In the U.S. market, both groups face negligible growth, says Glen Terbeek, international director of the food industry practice at Andersen Consulting in Chicago. That means companies trying to gain market share must wrest it from rivals, and they are turning to the sales data as a key.

"The point of sale is going to be the driving tool of the whole food industry, not just the retailer but the wholesaler and the manufacturer," Terbeek says. For their part, supermarkets will have to transform themselves from distribution organizations to businesses driven by consumer demand. "They'll have to maximize a store's potential in its marketplace. The best way to do that is going to be with point-of-sale data."

Customers believe *self-service checkout is faster and more accurate*

For years now, scanners have quickened the shopper's trip through the checkout lane, reducing supermarket labor costs and enhancing customer service. Scanners also make the checkout tally more accurate by eliminating misreading of price tags and improper cash register keying.

Gradually, grocers have learned to process the data gleaned by checkout scanners to identify the best-selling products and weed out less popular ones. By combining checkout scanner data with information from the warehouse, some supermarket operators identify the profits generated by individual items.

After a year of this type of analysis, Loblaws Ltd., a Toronto-based supermarket company, discontinued 700 less popular items while improving customers' perception of the assortment of goods it offers.

"It was more important to be in stock every day with your A items rather than stock the B, C and D items," says Douglas Tiggart, a professor of marketing at Babson College in Wellesley, Mass.

Few supermarket chains are issuing scannable identification cards to regular customers. The cards let the companies track an individual's purchases. The technology also facilitates "frequent shopper" clubs aimed at boosting customer loyalty as well as generating marketing information for supermarket owners.

One company that has established this type of club is Ukrop's Super Markets, Inc. in Richmond, Va. Two years ago, Ukrop's became the first user of software developed by Citicorp POS Information Services, Inc. that makes it possible for supermarkets to offer "electronic coupons" to club members.

No scissors required

The club works like this: Supermarkets enlist customers in a frequent shopper club by collecting information on them and issuing them a card with a scannable bar code. Club members are entitled to discounts on certain items that are promoted in mailings and in stores. When they pay for their groceries, their card is scanned. The Citicorp software records their purchases and grants the discounts, avoiding the need for the club members to clip and redeem coupons.

"It's been very successful for us. It gave us a new vehicle to speak to our customers through the monthly newsletter we send out," says Nelson Melton, vice-president of IS at Ukrop's.

Currently, one other chain is running the coupon program, a handful of others are testing it, and nine chains are testing a Citicorp program that offers customers rebates for buying products in specified quantities. In the rebate program, club members' monthly statements include a scannable check that they can use to reduce their grocery bills. The program offers rebates on 90 products from 34 manufacturers.

Other supermarket operators hope to follow the lead of Ukrop's and use customer information to direct discounts and rebates to consumers with certain demographic characteristics or particular shopping habits. For instance, a supermarket might promote its house brand of corn flakes to customers who buy the Kellogg's brand.

"It'll take a bit of time for the other chains," says Bill Ahearn, a Citicorp spokesman. "It takes a while to track purchasing information from households before you can use it to market to those households."

Citicorp lets supermarket operators use data culled from the point-of-sale software. However, Citicorp retains ownership of the information, which it is starting to sell to food makers.

In selling the information, Citicorp joins companies such as A. C. Nielson and Information Resources, Inc., which buy data from supermarkets and resell it. Their data also links sales information to the demographics of shoppers.

Since 1979, Information Resources has also offered a service called Behavior Scan that food makers use to track test-marketing of new products in six small cities. Information Resources gauges the effectiveness of advertising by controlling some of the commercials that participating consumers see on their cable television systems, then monitoring what the consumers watch and what they buy at the supermarket.

By and large, food makers are only moderately satisfied with the usefulness of the information they buy from the data syndication vendors and would like more analytical tools for massaging the numbers, says Tim Davidson, a consultant at Temple, Barker & Sloane in Lexington, Mass.

The analytical tools could become increasingly important as supermarkets and their suppliers try to gain the upper hand against one another with point-of-sale data.

However, the information could also forge closer working relationships between supplier and retailer. It could trigger orders for goods that would be delivered directly to stores, cutting the retailer's costs for warehousing and handling them, Andersen Consulting's Terbeek says.

Other developments suggest changes in the very nature of point of sale. A few supermarkets are experimenting with self-service checkout scanners. Some of the supermarkets are not only reducing labor costs but also finding that customers value the do-it-yourself option as an added service.

Roundy's, Inc. in Wauwatosa, Wis., is one of a half-dozen supermarket operators testing a self-service scanning system sold by Check Robot, Inc. in Deerfield Beach, Fla. The system weighs an item, generates a holographic image of it, then checks that information against a database to ensure goods are not mislabeled. To automate one checkout lane, including a payment station that can handle three lanes, costs about $30,000.

The self-service checkout technology delivers several benefits, says Don Twist, executive vice-president of Roundy's Pick 'N Save supermarkets. It helps the company deal with a shrinking pool of available workers and generates data not previously available, such as names of items that aren't scannable and the number of goods passing through each lane.

Furthermore, customers like the self-service option. They find it faster than the regular checkout, according to Twist. They also perceive this method as being more accurate, even though all the scanners run off the same database and thus are equally reliable. He says he expects his company to buy the four self-service lanes it is testing and perhaps more of them.

In an alternative scenario, supermarkets would do away with the checkout counter as we know it. Albert Heijn BV, a supermarket operator in The Netherlands, is experimenting with shopping carts that contain a scanning device, so shoppers need only pay a cashier after collecting and ringing up their goods. Heijn has been testing the scanner-equipped cart in one store for 1½ years using 300 volunteer customers.

Senior Editor Amiel Kornel contributed to this article.

Ludlum is a *Computerworld* senior writer.

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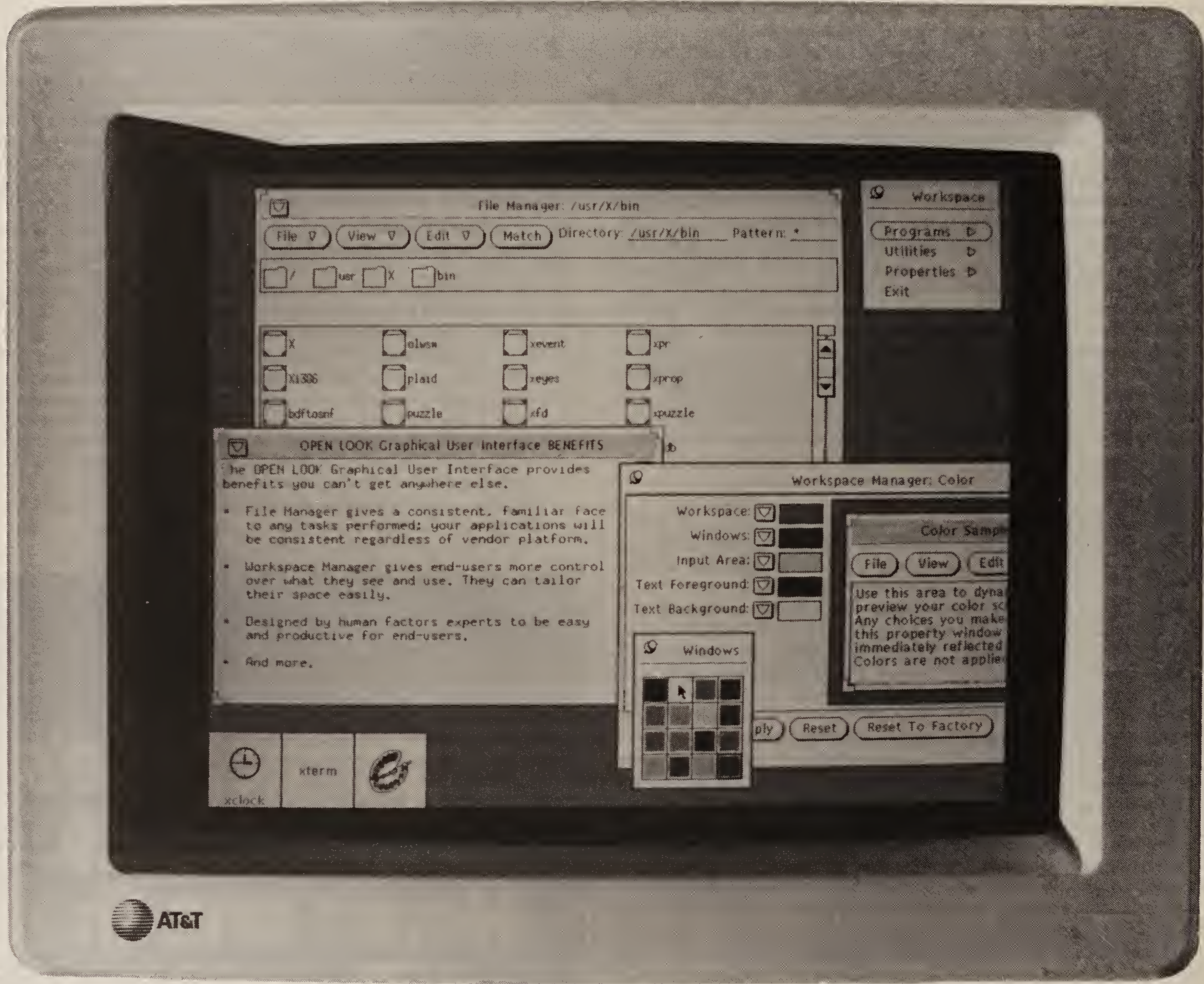

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IN DEPTH

Motivating analysts and programmers

Interesting work, growth opportunities and good compensation make technical personnel tick

BY J. DANIEL COUGER

Do you know this person? He prizes interest and diversity in his work and wants to use a variety of skills in a meaningful job. He likes to guide a project from beginning to end and prefers to work autonomously — and alone. He needs to see the direct impact of his efforts and wants to hear what you think about his performance. No dummy, he's interested in a fair wage and good benefits to keep up with inflation and the high costs of education and housing. He also wants to keep on growing professionally. Recognize him yet? He's the typical analyst or programmer in your information systems department — and you'd better say hello before he says goodbye for greener pastures.

Perhaps the most important personnel issue facing IS managers during the 1990s will be the impending shortage of new workers. Fewer college students are choosing majors in computer science and IS; the decline in enrollments in these fields is already evident. This prospective labor shortage means that IS managers must place greater emphasis on reducing turnover of analysts and programmers.

Ten years ago, I conducted a national study of IS personnel to determine what motivates them. Last year, I replicated the study with 1,800 people who represent all of the nation's major industries and geographic areas. For analysts and programmers, some things have changed drastically over the last decade.

For starters, pay and benefits are more important than they were 10 years ago. The relative importance of working conditions and company policies remains constant. The major change is the increased need for challenging work — an issue that has far-ranging implications for IS managers trying to control staff turnover.

RON BELL

Working motive

In 1980, programmers and analysts ranked the work itself as the second most important motivator. It is now ranked first by a very strong margin. However, simply knowing that employees are motivated by an interesting job is not enough for managers searching for ways to enhance the work; they need to know which parts of the work most influence motivation.

Behavioral science researchers have developed a model for occupations in which the work itself is the key motivator. After evaluating some 30 work variables in order to determine which areas are most sensitive to motivation, they have identified five key factors, referred to as "core job dimensions." The right mix of the following factors will produce motivation and productivity on the job:

- **Skill variety.** The degree to which a job requires a variety of activities necessary to carry out the work. This involves the use of a number of the person's different skills and talents.
- **Task identity.** The degree to which the job requires completion from beginning to end, with a visible outcome.
- **Task significance.** The degree to which the job has a substantial influence on the lives or work of other people, whether in the immediate organization or externally.
- **Autonomy.** The degree to which the job gives the individual

• Unfulfilled workers are likely to leave

• IS managers can do a lot to boost satisfaction

• 1,800 people surveyed in major industries

Couger is a Distinguished Professor of Information Systems and Management Science at the University of Colorado in Colorado Springs. He is the author of 16 books and more than 120 papers.

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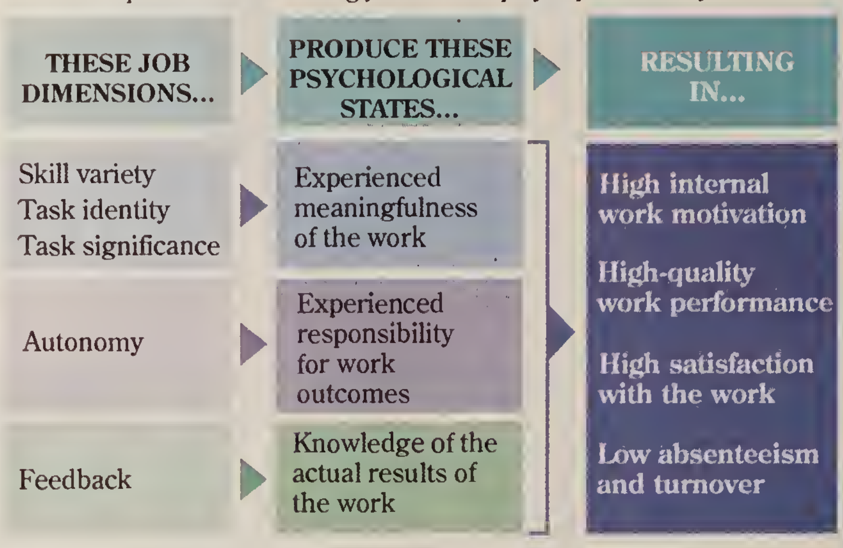
sufficient freedom, independence and discretion in scheduling work and determining procedures to be used in carrying it out.

- **Feedback from the job.** The degree to which carrying out the work activities required by the job results in direct and clear information about the effectiveness of the employee's performance.

If these five dimensions are present in the correct mix, employees experience meaningfulness, responsibility and knowledge of results. The presence of these vital psychological factors produces motivation, boosting productivity and increasing job satisfaction. Better quality output and lower turnover will then result.

How good jobs keep workers

A model developed by behavioral science researchers shows a clear relationship between rewarding jobs and employee productivity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RESULTING IN...
Skill variety
Task identity
Task significance
Experienced meaningfulness of the work
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Feedback
Knowledge of the actual results of the work
High internal work motivation
High-quality work performance
High satisfaction with the work
Low absenteeism and turnover

SOURCE: J. DANIEL COUGER, UNIVERSITY OF COLORADO

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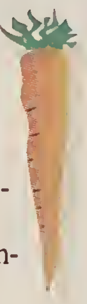
Need for growth strong

However, knowing that the work itself is the most important motivational factor for programmers and analysts will not in itself help reduce turnover. Managers concerned about employee achievement also need to ask themselves the following question: How rich does the work have to be in order to provide proper motivation for programmers and analysts?

Ten years ago, the growth needs of programmers and analysts were higher than the need for challenges at work. This is not surprising; the computer field, which changes constantly, attracts people who are not threatened by the need to constantly retool. In fact, these people would probably be bored quickly in a field that did not provide continuous opportunity for growth and achievement.

Develop a green thumb for fostering job growth



A good information systems manager fosters an environment in which programmers and analysts can thrive. The following are some tips to energize your staff:

- Keep the work interesting and challenging.
- Make sure the job enables employees to blossom professionally and personally. The individual's need for growth is integrally tied to a job's capacity to motivate.
- Set up an environment in which an employee can be autonomous.
- Offer general and specific feedback on the employee's job performance.
- Give the employee a sense of his global worth, that is, how his individual contribution fits into the larger corporate picture.
- Provide competitive wages and benefits.

Today, the growth needs of programmers and analysts are significantly higher than they were 10 years ago. In other words, the field is attracting people with an even higher need for professional and personal development and achievement.

If IS managers can keep the work interesting and challenging, workers with high growth needs will be both motivated and productive. If the work is not able to provide the proper challenge, people will be less productive and will tend to seek jobs elsewhere.

Mismatches in which the growth need is too low are uncommon in IS. A more common problem is a job with inadequate challenge. The good news is that IS managers are in an excellent position to enrich the employee's job by creating a better match between the person's growth needs and a job's motivating capacity.

Individual evaluation

It would be a mistake to assume that every programmer or analyst has the same needs for career growth, however. Managers need to evaluate the growth needs and job motivators for each person reporting to them.

Rarely do mismatches between a job's motivating capacity and individual's growth needs occur throughout an IS organization. Instead, poor matches between duties and growth needs usually occur in one job type — perhaps network designers in one company or database administrators in another.

The symptoms of mismatch are usually apparent. Most can be lumped under the heading of "job dissatisfaction," since the work itself is the most important motivator for these workers. High turnover is one indicator. The procedure for enriching core job dimensions applies for individuals or a group of persons in the same job type.

When a mismatch occurs, the manager needs to evaluate the job within the framework of the five core job dimensions.

Fortunately, most of the factors for enriching a job are controlled by the immediate manager. He can easily influence autonomy and feedback, for example. The manager also can boost the subordinate's ability to relate assigned tasks to the whole project.

There are several ways to accomplish this. One is to spend more time explaining how an employee's tasks relate to the group's efforts. The manager can also arrange for subordinates to hear presentations from users — the primary conveyers of application importance.

Only the core job dimension of skill variety is less controllable by the immediate manager. For example, in a maintenance assignment, personnel are often constrained by prior application development methodologies: They must accomplish a change request within those constraints. But even here, the IS manager is not powerless; users may be convinced to combine requested changes into a set large enough to permit the use of more recent methodologies.

Needed: More feedback

In the 1980 survey, respondents said that IS managers needed to provide more feedback, both in general and about specific goals. Unfortunately, the situation has not improved over the last decade.

Today's programmers and analysts still say they feel that feedback is inadequate — a surprising result, given the publicity that surrounded the earlier survey. One explanation is that under the pressure of budgets and schedules, feedback is the easiest thing to postpone. Bosses and users cannot be put off but feedback to subordinates can be. It is puzzling that managers — so well organized in handling their myriad of tasks — do not put feedback high on the agenda.

Fortunately, improving feedback is easy compared with some other areas.

Satisfaction varies

For the most part, the responses of programmers and analysts are very similar, except in one area: job satisfaction.

Analysts reported being satisfied, both in general and specifically with their managers. However, the ratings for programmers were well below those of analysts in both satisfaction categories. Ten years ago, programmer ratings were very similar to those of analysts.

Since other satisfaction categories such as pay were relatively unchanged in the latest survey, one can assume an influence on general satisfaction for programmers. A possible explanation is that IS managers are devoting more of their attention to the more senior persons, who are typically analysts.

While the computer field attracts people with the highest growth need of all 500 occupations measured, they have the lowest need for social interaction.

This was true a decade ago and is still true today. The most likely explanation is that programming jobs are the entry-level position for most programmers and analysts. Since the job can be done without much interaction with other people, the programming environment is attractive to those with low social needs.

How can such a condition exist when programmers often must work in teams? "Don't they have to interact regularly with their teammates?" you ask. The "80/20" rule applies here: Marketing personnel assigned to a team normally spend 80% of their time in team meetings. In contrast, IS personnel assigned to a team normally spend only 20% of their time in such meetings. They do the necessary coordination between tasks with their teammates and then go back to their desks to accomplish the major part of their assignments.

This low social need has some negative effects, however. While the IS team can minimize communication to meet its low social needs, users require more interaction. Although analysts bear the brunt of communication with users, their social need is no higher than programmers. Because the normal career path is from programming to analysis, programmers carry their low social needs along with them into the analyst position. Thus, many employees will typically need training to improve the behavioral skills that will enable them to communicate more effectively with users.

> **I**F THESE FIVE dimensions are present in the right mix, employees experience meaningfulness, responsibility and knowledge of results.

IS managers can make good use in this area of another characteristic identified in both surveys: the high goal orientation of programmers and analysts. If managers negotiate with employees to improve their behavioral skills, the high goal orientation of programmers and analysts will motivate them to acquire those skills.

Money more important

Over the decade, pay and benefits moved from No. 8 in the survey to No. 4, dropping recognition to No. 5.

The elevation of pay and benefits is undoubtedly because of the effects of inflation — a significant factor during that period. Higher costs for housing and education also have eroded earning power, and companies often are slow in providing equity adjustments. As a result, pay and benefits have taken on more importance over the decade. In the '90s, IS management needs to keep pay and benefit increases consistent with the rising cost of living.

Issue won't go away

The impending labor shortage of the '90s means that reducing turnover for analysts and programmers will become a more critical issue.

Fortunately, IS managers control the key factor that motivates programmers and analysts: the work itself. Managers can evaluate the relative need for growth among employees and assign the richer tasks to those with greater needs. For jobs in which the work is less challenging, managers can evaluate ways to enrich the job's motivating capacity, using the framework of the five core job dimensions essential to motivation.

While improving feedback, pay and benefits is important, eliminating mismatches between the employee's growth needs and the job's motivating capacity is the most important way to motivate analysts and programmers. Doing so will make programmers and analysts more productive while eliminating feelings that they need to leave the company to realize job satisfaction. •

COMPUTER INDUSTRY

INDUSTRY INSIGHT

Charles Varga

A question of ledger domain

You've heard it before: "Certified public accountant in auditing firm denies any knowledge of wrongdoing. Principals and management, in conspiracy with directors, allegedly . . ."

And when the recent mess at Miniscribe, complete with cinder blocks shipped and booked as disk drives, jells into legal action — an event expected to take place any day now — you're probably going to hear it again.

Questions beginning with "where" seem to sell: We've already been through "Where's the beef?" and "Where was George?" so it should come as no surprise if — faced with a case in which a major national accounting firm gave its seal of approval to a publicly held firm that may have sold some of its customers tons of nothing — somebody thinks to ask, "Where were the auditors?"

And, come to think of it, where are *your* auditors? And where does this leave you?

Two leading authorities on the accounting profession raise the possibility of an unsettling answer to the first question. Your auditors may be just where they ought to be — going through your company and its books — but disconcertingly lacking in knowledge of what to look for, where and how to find it or what to do with it when and if they do. Abraham Briloff, Professor Emeritus at Bernard M. Baruch College, said he believes that we're seeing the result of a CPA brain-drain that has the best and brightest in accountants flocking from traditional auditing to their firms' more re-

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- IBM, Apple granted tariff exemptions. Page 82.

Company school days

In-house schools take on U.S. educational woes

BY ELLIS BOOKER
CW STAFF

SCHAUMBERG, Ill. — Facing a dwindling supply of workers with basic reading, math and analytical skills, America's top corporations are getting into a new business — education.

This month, Motorola, Inc. is taking corporate-sponsored training to its next logical dimension, opening what it calls Motorola University. The semiconductor and manufacturing giant said last month it would reorganize its award-winning training and education organization and mandate a minimum of 40 hours of instruction per year for each of its 100,000 employees worldwide.

Motorola's stated goal is to have its entire U.S. work force at a seventh-grade reading and math level by 1992.

Motorola U. President A. William Wiggenhorn unblinkingly stated that as many 25% of the workers in Motorola's manufacturing and support operations do not meet these standards.

Major U.S. companies, Wiggenhorn said, are investing huge sums (see story this page) to fight a two-front educational war. On the one hand, they must teach basic literacy and English comprehension to an appallingly large number of their workers who lack these fundamental skills. Meanwhile, flattened corporate organizations, made possible in part by the advent of computer and communication technologies, are requiring workers to handle new jobs and expanded responsibilities.

TOM MONAHAN

"The more we automated the business and the more we tried to educate our people, [the more] it became obvious we had some basic literacy problems," Wiggenhorn said.

Beyond the full literacy goal, Motorola U.'s full-time staff of 110 will coordinate a host of training and educational activities from seeking accreditation and acceptance of Motorola classes at local universities and colleges to working with elementary schools. The employee training part of the project alone will cost an estimated $60 to $62 million, not including labor costs while workers attend classes.

Currently, Motorola — which has spent some $150 million on training during the past three years — is investing about 2.2% of payroll in training. That amount, Wiggenhorn said, will grow to 3% under the university structure.

Continued on page 82

Sharpening your employees

Motorola U. is the vanguard of a movement among U.S. firms to educate — some would say "retool" — their workers.

According to the American Society for Training and Development (ASTD) in Alexandria, Va., U.S. companies spend $30 billion — or about 1.5% of their payroll — on formal employee training.

However, the Alexandria, Va.-based association, which represents more than 4,500 industry, education and government organizations, recommends a short-term increase in this funding to $44 billion, or 2% of payroll, and a long-term increase of $88 billion, or 4% of payroll.

Why such a jump? Maybe because the ASTD predicts that by the year 2000, 75% of all currently employed workers will need retraining.

Meanwhile, companies are becoming aware that successful in-house training requires employees who enter the firm with a grasp on the 3 Rs — reading, 'riting and 'rithmatic — and that they cannot assume this will be the case. According to the Council for Aid to Education, U.S. companies donated $225 million to schools last year, up sharply from the $100 million they spent just three years ago. Prominent among them was IBM, which pledged $25 million over five years in 1988 and added a 1989 pledge of another $25 million to elementary and high schools during the next five years.

ELLIS BOOKER

Integrators choke in legal loophole

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — A federal law written during the Great Depression — long before the computer industry was born — has come back to haunt today's computer systems integrators in the $7 billion federal government market.

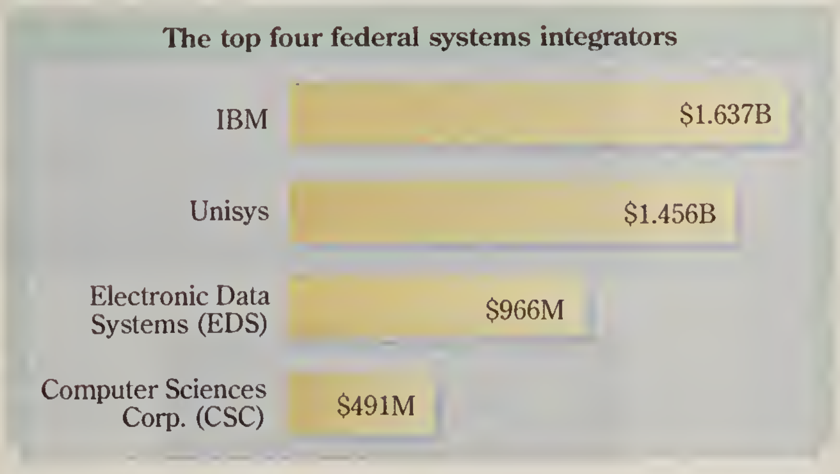
The Walsh-Healy Public Contracts Act of 1936 states that federal contracts of more than $100,000 must be placed with either "manufacturers" or "regular dealers." The problem is many systems integrators do not fall neatly into either category.

Until their status under the Walsh-Healey Act is clarified, systems integrators are vulnerable to having their bid disqualifications by contracting officers as well as contract appeals from losing bidders.

In the past, federal program managers "have often looked the other way on vendor compliance" with Walsh-Healey in order to satisfy urgent agency needs for computer systems, according to a report by IDC Washington, Inc., a market-research firm in Vienna, Va.

Billions and billions

Analysts estimate that the federal systems integration market is worth about $7 billion



SOURCE: WARREN H. SUSS ASSOCIATES

CW CHART: DOREEN DAHLE

Info assemblers

Adapso, a trade association representing about 150 systems integrators, has always maintained that integrators qualify under the manufacturing category because they are "assemblers" of information systems, according to Olga Grkavac, Adapso's vice-president of government relations.

Nevertheless, Adapso recognized that the law is creating uncertainty and began a campaign more than two years ago to get an official clarification from the U.S. Department of Labor. Last June, the Labor Department issued a proposed regulation that carves out a special place for information systems integrators in the "regular dealers" category.

Off the tracks

Although the Labor Department proposal satisfied the industry and federal agencies and was headed for final approval last month, it was derailed by a series of hearings held by the House Committee on Government Operations [CW, Nov. 13, 1989].

According to deputy assistant secretary William E. Andersen, the proposed regulation has been put on hold and will be opened to further public comment because of charges aired during the hearings that some minority-owned systems integrators have violated Walsh-Healey rules against "bid brokering."

During the hearings, Derek J. Vander Schaaf, the Pentagon's deputy inspector general, said the minority-owned firms were acting as fronts, or bid brokers, to help hardware vendors such as IBM circumvent regular com-

Continued on page 78

Integrators

CONTINUED FROM PAGE 77

petitive procurement procedures. Bid brokering, in which the broker adds no value to the product but marks up the price, is illegal under the Walsh-Healey act.

The Labor Department, when reexamining its proposed regulation on systems integrators, is expected to make sure that bid brokering is not given a safe haven in the systems-integration definition.

"If their intent is to eliminate bid brokers, Adapso doesn't have any problem with that," said Adapso's Olga Grkavac, although Adapso officials said the term systems integration already is narrowly defined in the proposed regulation.

IDC's report said that systems integrators are not guilty of the "brokering evils that Walsh-Healey was designed to cure" and that clarification of the antiquated law is long overdue. "Had the change been made several years ago, many of the likely [contract] award discrepancies in this area would have been unnecessary," the report said.

Adapso hopes the Labor Department regulation will sail through quickly. "We'd love to see the process restarted and have [the proposed regulation] published for public comment again. There were no negative comments the first time it was published, and we're optimistic that would happen again," Grkavac said.

Define your terms

Ever had trouble defining just what a systems integrator does? Well, the Department of Labor has grappled with that issue and has come up with a definition: "an established business which is engaged in contracting to provide fully operational information processing systems" that meet the buyer's functional specifications. The agency then made the following list of systems integrator functions:

- Analyze the buyer's requirements and needs.
- Assess currently available technological offerings and identify/evaluate alternative system designs.
- Determine the composition of the system.
- Select and deliver information processing resources.
- Customize, modify or configure components if necessary.
- Assemble, install, test, implement and render operational the final system.

MITCH BETTS

IN BRIEF

Dear departure

Control Data Corp. last week said it expects the financial results for its fiscal year just ended to reflect approximately $650 million in restructuring costs. That figure will include an estimated $105 million fourth-quarter reserve to cover the expenses of selling 5-year-old chipmaker **VTC, Inc.**, the last of the unprofitable businesses that CDC has been shedding under the guidance of newly elected Chief Executive Officer **Lawrence Perlman.**

....

Goal ups the score

Columbus, Ohio-based software vendor **Goal Systems International, Inc.** kicked off the new year with its third acquisition in as many months. This time out, it's **Tower Systems International**, a privately held California-based firm that makes tape- and disk-management systems for IBM mainframes and compatibles. Under the agreement, Goal will pay approximately $8 million plus royalties.

....

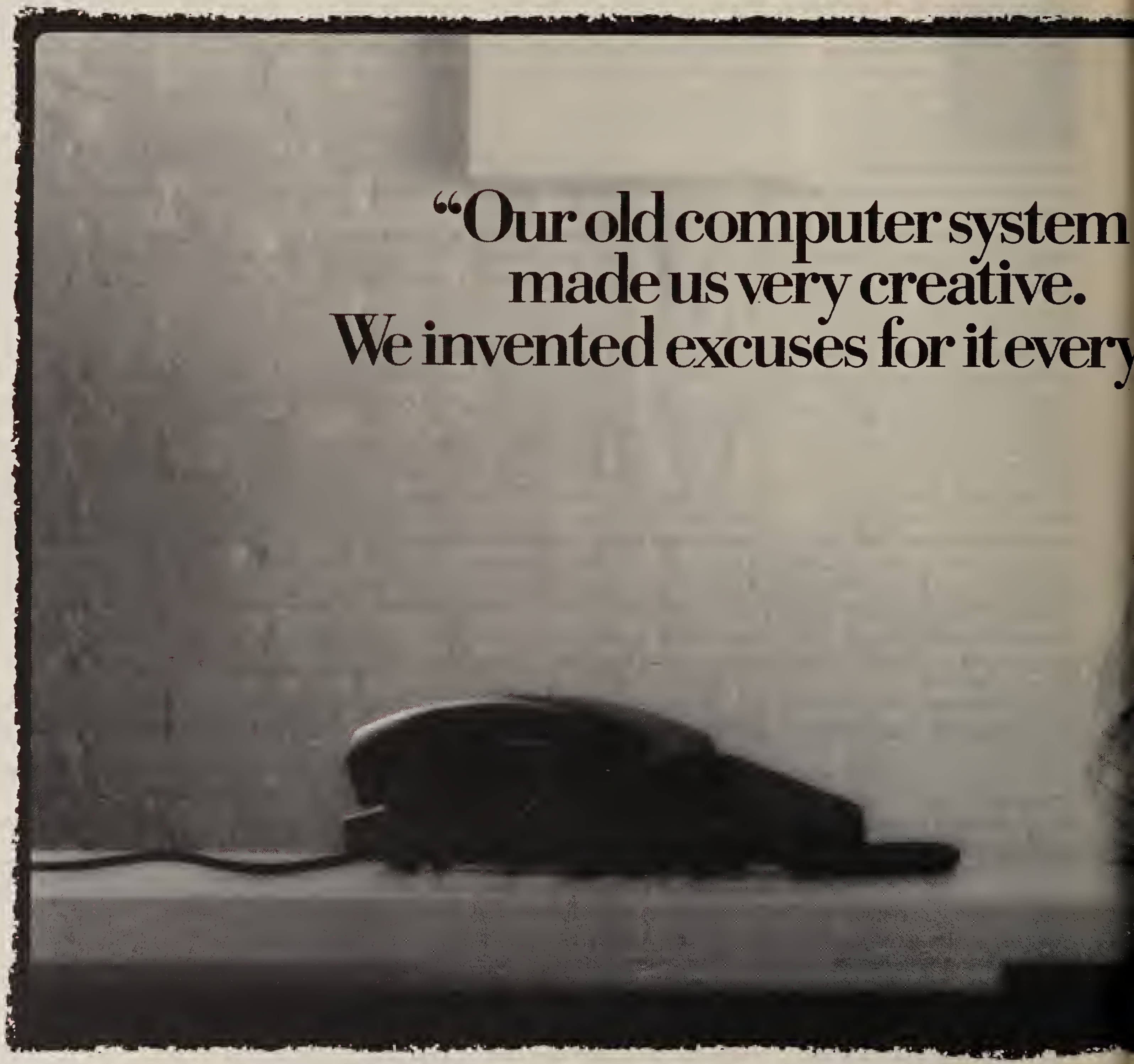
Ads subtracted

One of the frills that **Wang Laboratories, Inc.** apparently has decided it can do without in its relentless effort to restructure for profitability is its former 25-person advertising department. A Wang spokeswoman confirmed last week that the layoff of 20-plus staffers that reduced the department to a mere executive function was a part of the job cut announced last fall.

....

Comings, goings

Billion-dollar player **Computer Sciences Corp.** sold a 5% stake in its **Infonet Services Corp.** global telecommunications affiliate to **Kokusai Denwa Company Ltd.** The deal, consummated for an undisclosed sum, leaves CSC with 30% of Infonet and adds Japan to a list of international Infonet shareholder sites that includes France, West Germany, Belgium, the Netherlands, Sweden and Spain.



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Nakamichi moves Mountain to profit

BY RICHARD PASTORE
CW STAFF

CAMPBELL, Calif. — While some industry observers are concerned over Japanese ownership of U.S. technology firms, no one at Mountain Computer, Inc. is complaining. The tape-drive maker is apparently thriving after 14 months under Nakamichi Corp of Tokyo.

Mountain, headquartered here, has racked up impressive numbers — 76% revenue growth since 1987, according to Jay Bretzman, an analyst at Framingham, Mass.-based market research firm International Data Corp.

Both new and veteran Mountain executives attribute much of the success to the business environment fostered by its Far East parent. Because the acquisition brought a ready source of capital, "we don't have to be so shortsighted," said Gary Franza, vice-president of North American sales, who has worked under both the U.S. and Japanese regimes.

Franza

"The focus on quarters and cutting budgets magically went away," said Tom Toperczer, vice-president of marketing.

Toperczer recently left a marketing post at a competing firm that was run in the more traditional quarter-to-quarter American way. At Mountain, Toperczer said, he can afford to be less sensitive to short-term market changes; he now has the luxury of looking at long-term development.

The payoff from this privilege is competitive advantage, Toperczer said. For example, Nakamichi has given Mountain the permission and resources to set up a large-scale off-site software development project — something that will require a "tremendous amount of commitment," he said.

Under its former U.S. ownership, Mountain's software scheme would have been a series of piecemeal projects with short-term goals rather than an all-out effort, Toperczer said.

"It would have taken longer, been less complete and we might have missed out on some degree of the market opportunity," he added.

Toperczer

In general, the company's Japanese owners have "a better understanding that a quality product takes time," Toperczer concluded.

As peachy as it seems, the change in ownership did not come without a few qualms. "People warned us that the Japanese would come in and tell us what to do," Franza said. "They have a tradition of trying to influence a business that they don't understand [we were told], and they can be quick to criticize and change management."

Indeed, the Japanese owners "have shaken their heads at some of the things we've done and the way we go to market," Franza noted.

> "I VIEW THIS as an opportunity to learn Japanese management techniques. Sticking your head in the sand and saying, 'We're not going to learn this' is part of the reason [U.S. business] is in this mess."
>
> GARY FRANZA
> MOUNTAIN COMPUTER

Nakamichi offered to implement its favored marketing practices but allowed Mountain to choose its own path. "It must have been hard for them to accept, but it would have been tragic if they had tried to strong-arm us into adopting their practices," Franza said. Nakamichi also dictated little change in personnel, according to Franza.

Successful Mountain

The owner's laid-back attitude may owe much to Mountain's current success, Franza admitted. "If we went off our sales plan . . . who knows," he said.

Even with Nakamichi's benign administration, however, some Mountain staffers chose to go elsewhere at the time of the acquisition.

"We lost some people who didn't want to make the 'land of the rising sun' stronger than it already is," Franza noted.

Such refusal to work for the Japanese is closed-minded, Franza said. "I view this as an opportunity to learn Japanese management techniques," he said. "Sticking your head in the sand and saying 'We're not going to learn this' is part of the reason [U.S. business] is in this mess."

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Adobe lets revenue do talking

BY CHARLES VON SIMSON
CW STAFF

MOUNTAIN VIEW, Calif. — In September, John Warnock's emotional defense of a single-font print standard raised the industry's collective eyebrows. Three months later, his company, Adobe Systems, Inc., is making a quieter but significant position statement by means of its mounting revenue.

Adobe's Warnock

"When [Microsoft Corp. and Apple Computer, Inc.] announced they would create a separate offering, I saw font development taking an enormous step backward," said Warnock, Adobe's chairman. "But today, I am convinced that the market will speak for [Adobe's] Postscript. I respect their ability to change the market, but our latest efforts prove that our work has paid off."

The payoff is the sale of more than 100,000 copies of the Adobe Type Manager in just the first six weeks. Type Manager enables the production of Adobe type on an Apple Macintosh screen and allows it to be printed on non-Postscript printers, giving Adobe access to new markets.

In September, Microsoft announced its selection of Apple's Royal font technology as the outline font-scaling system for OS/2 Presentation Manager as well as for future Apple and Microsoft Postscript-based printers. Microsoft and Apple have not yet released any products based on the alliance, but observers said that Microsoft will have to deliver something by summer.

Sales of Type Manager have continued strong; while Adobe will not release exact figures, the product is credited with the heady growth of the firm's product sales of $34.7 million in 1989, an 80% increase over $19.2 million in 1988.

That revenue buoyed the company's 45% growth in net income from $83.4 million in 1988 to $121.3 million in 1989. However, Adobe's main business remains royalties from use of Postscript. Royalty revenue grew from $61.6 million in 1988 to $81.8 million in 1989.

Apple is still Adobe's largest customer, but the share it contributes is eroding. While Apple accounted for 25% of Adobe revenue in 1989, that was down to 21% in the fourth quarter.

It is a trend that troubles Warnock, who claims the relationship is getting stronger. "The low point of our relationship with Apple was their announcement with Microsoft," Warnock said. "But since then, I think we have both realized that we depend on each other in important and subtle ways."

Perhaps, but analysts said that Apple's contribution is likely to continue to decline for two reasons. First, Apple's own overall business has been slowing. In addition, it is only a matter of time before it releases its competitive product, currently under development.

"If Microsoft can come out with a font product by this summer's [Apple] System 7.0 announcement, then Apple has no reason to go with Postscript," said Frederick Ruvkun, an analyst at Morgan Stanley & Co. "But if Microsoft has any technical problems, Warnock could come out smelling like a rose."

Analysts have also expressed concern that Adobe was giving up some long-term revenue growth when it announced its decision to open up its Postscript technology the day after the Apple/Microsoft announcement. Adobe agreed to publish the details of its encrypted font format in an effort to prevent mass defections from its implementation of Postscript.

"A French dictionary doesn't mean you can write a Victor Hugo novel, but it is a prerequisite. Now that the dictionary is out, you may see a squeeze on margins," Ruvkun said.

IBM, Apple get tariff break from Treasury Department

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The U.S. Department of the Treasury has granted IBM and Apple Computer, Inc. special one-time exemptions on tariffs for motherboards imported from Japan.

The decision covers a period in 1987 when personal computers from Japan were hit with a 100% punitive tariff because of alleged Japanese violations of the U.S.-Japan semiconductor trade agreement. The exemption is expected to save nearly $19 million for IBM and as much as $2 million for Apple, a U.S. Customs Service official said.

Surprise

On July 2, 1987, the Customs Service shocked the industry with a ruling that motherboards should be classified as complete computers, which were subject to the 100% tariff. On Nov. 11, 1987, the agency reclassified motherboards as "unfinished computers."

The Treasury Department ordered the Customs Service to grant IBM and Apple a 90-day grace period that waives the tariff for all but six weeks of the time the motherboards were subject to the 100% tariff. The agency explained that prior Customs Service actions had led the companies to believe that motherboards were computer parts, which were not covered by the tariff.

Company

FROM PAGE 77

Attendance at Motorola U. is not entirely voluntary. The firm committed to retraining its work force in 1986, when it said it would not lay off workers solely as a result of automation.

"We said we'll provide you with retraining until you achieve a new set of skills," Wiggenhorn explained. "If, on the other hand, you refuse to take retraining, you can be terminated."

Underscoring its emphasis on education, Motorola last year modified its original policy mandating a 50/50 split between employee and company pay for continuing education. The firm now picks up 100% of the charge.

Full funding led Motorola, which spends $4 million on tuition reimbursement annually, to become more involved in the quality of outside courses employees took and even in their elementary and secondary school preparation before joining the company, Wiggenhorn said.

"It hit us that [schools] didn't know what we were doing," he said. "None of them had ever been in a semiconductor plant, and they had a view of manufacturing that said smokestacks." He said visitors to Motorola's facilities — teachers and students alike — have been amazed to find manufacturing employees working at keyboards.

More broadly, Wiggenhorn believes educators need to understand some of the dramatic changes in U.S. business during the past decade. "People are working in teams. . .We aren't trying to have Lone Rangers and Lone Rangerettes shoot each other out any more," he said. "Yet, if you look at what is being taught in the schools, it is still about individual competition."

Inattentive

But Wiggenhorn is also critical of industry, which he said has lured away the best and brightest in education but not paid much attention to educational institutions otherwise. He noted that of the hundreds of attendees at a conference on education organized by Eastman Kodak Co. last November, only 20% came from industry. Still, the corporate investment is increasing (see sidebar).

To date, Motorola has identified 28 curriculum maps for its university and is developing a second series to address strategic issues such as "total customer satisfaction" and integrated design and manufacturing, which will be cross-functional. Wiggenhorn hopes that Motorola's classes eventually will gain accreditation from other schools, including the granting of degrees.

Motorola U.'s Wiggenhorn *beams over his firm's educational program*

Motorola U., which grew out of a concept originated by Motorola Chairman Robert W. Galvin back in 1980, is no academic exercise.

"It's our responsibility as an employer to tell you what's going to be needed and provide you the opportunity to get it," he said. "And it's your responsibility as an employee to take the course and apply the knowledge back on the job."

Varga

FROM PAGE 77

cent, and considerably more lucrative, information management sides.

"We're just not doing what we're supposed to be doing in terms of our commitment to the audit responsibility," Briloff said. "I refer to it as the headless horseman [effect]. We're running about in all directions at once; we have lost the sense of focus and commitment to the sole professional responsibility we're presumed to have consistent with society's mandate — that which is embraced by the CPA degree, which is the audit of financial statements. We have denigrated that responsibility and that function because we're concentrating on the more lucrative aspects of management advisory service."

The lesser lights left on the pure accounting side, he said, don't necessarily have the raw talent or the training — including computer literacy — to perform audits on organizations whose increasingly automated offices operate in an increasingly complex business environment.

The problem, Briloff said, isn't likely to clear up in a world where "management advisers" get perks and "bean counters" get mocked.

Jack Bologna, professor of management at Siena Heights College, agreed. He also noted that while unskilled auditors may not be able to finger fraud, corporations sued for fraud are getting quite good at fingering unskilled auditors.

A 1983-85 study Bologna conducted revealed 75 regulatory or stockholder actions brought against the top 20 U.S.-based CPA firms because of allegations of undetected fraud. The costly lawsuits that resulted in many cases were generally settled in favor of the plaintiff.

Maybe the Miniscribe case, once there is such an animal, will be the one that focuses enough attention on the unskilled auditor question to raise a few good answers.

Meanwhile, we're stuck with the second question: Where does this leave you?

One answer is: Up the creek — along with the other members of a business caught up in and caught at practices that a rigorous audit might have forestalled.

Another answer might be: In a position to aid your auditor by baring some of the mysteries of your company's record-keeping system or maybe even by rendering it less mysterious in the first place. Granted, it's a strange turn of events when we have to watch the watchdogs. On the other hand, it beats getting bit.

Varga is a 21-year computer industry veteran based in Frenchtown, N.J.

What color is your resume?

Debunking the need-for-two-white-pages myth and other conventions

BY MARK DUNCAN
SPECIAL TO CW

Perhaps it is only the information systems profession, but job applicants, whether junior programmers or senior technicians, have somehow been convinced that a resume must be two pages — no more, no less.

Needless to say, it is utter foolishness to limit a description of your talents, skills and experiences on the basis of an inexplicable convention. The well-worn argument waged in favor of this convention is that managers are busy people and do not have time to read more than two pages of anything.

Nonsense! If a manager's motivation for reading or not reading something is based on length, his mistakes will be many and frequent, and his decisions will be weak.

Consider the following scenario: Acting as an intermediary, you deliver a four-page resume to your manager for a colleague. What are the chances of your manager scrutinizing the resume promptly? Now, what if the president of the company hands your manager a six-page resume and asks him to weigh the strengths and weaknesses of the candidate? Chances are the manager will know that resume inside out by the next day. So, length is a poor criterion. Indeed, one should question the propriety of working for someone whose objectivity is determined by word count.

Moving on from the number of pages in a resume, what is its essential purpose? It is a marketing tool, an advertisement used to convince a prospective employer (who is undoubtedly looking at many such advertisements) that you are the right person for a job. But if your resume looks and reads like the others, why should it get the special attention and treatment you think it deserves?

In modern business, the strategic imperative for organizations is to differentiate themselves from competitors, not only through product or service quality but also through eye-catching packaging and attractive side benefits. A product or service gains no edge by looking, feeling and behaving exactly like all its competitors.

The same is true of resumes. A resume is your first — and possibly your most important — opportunity to differentiate yourself from rivals. Broadly speaking, content and appearance represent the two key opportunities for differentiation.

Why shouldn't your resume arrive in a customized envelope with a printed return address instead of a gummed label? Why shouldn't the envelope and paper be color-coordinated? Plain white stationery pales next to the aesthetic blues, grays and beiges available at most stationers.

In terms of format, there must be better and more practical alternatives to the underlined dates and company names, followed by a dry paragraph in incomplete and grammatically incorrect phrases. It may come as a surprise to some, but written English is governed by universal rules, regardless of context, which render inexcusable passages such as this: "Senior analyst on two systems. Project leader on one. Responsible for analysis, design and development. Supervised two programmers. Troubleshooting and maintenance skills."

Although the reader may extract the information, he undoubtedly could do so more easily if it was written in correct English. If brevity is required, consider using a tabular format in which one column may have dates and position, another hardware and software and a third having company name and experience. Horizontal and vertical lines make the format truly tabular. This format lends itself to candidates with extensive or varied experience, because information of this nature is easier to comprehend and retain in tabular form.

> A RESUME IS YOUR first — and possibly your most important — opportunity to differentiate yourself from rivals. Broadly speaking, content and appearance represent the two key opportunities for differentiation.

Dare to be different

As for the appearance of text, the capabilities of word processors and desktop publishing software have opened up myriad possibilities. The fonts and print styles available mean no two resumes need ever look alike. Page layout must be pleasing to the eye and can now be enhanced by different print sizes, underlining and bold-facing to separate information or emphasize items.

Resume content is governed by common-sense criteria. Facts must be presented honestly and unambiguously. The reader must have no difficulty in extracting experiential data to match with job requirements. Be wary, too, of jargon. It is all too easy to pepper a resume with machine model numbers and esoteric language names. This is occasionally legitimate when very specific experience is demanded, but otherwise keep jargon to a minimum.

Beyond this, a resume must also offer a certain comfort level for its subject. A resume is a very personal item and must therefore be a reflection of oneself in tone, appearance and style. It must be thorough, yet not too elaborate; it must show self-assurance without showing immodesty.

To be an effective marketing tool and to serve its intended purpose, a resume must be perfect. Remember, you are trying to favorably differentiate yourself from others. Even if it turns out that other people possess identical experience, the way that experience is presented may determine who is called for an interview. Failing to take advantage of the potential power of resumes is a wasted opportunity.

Duncan is a quality assurance consultant at a large Dallas bank.

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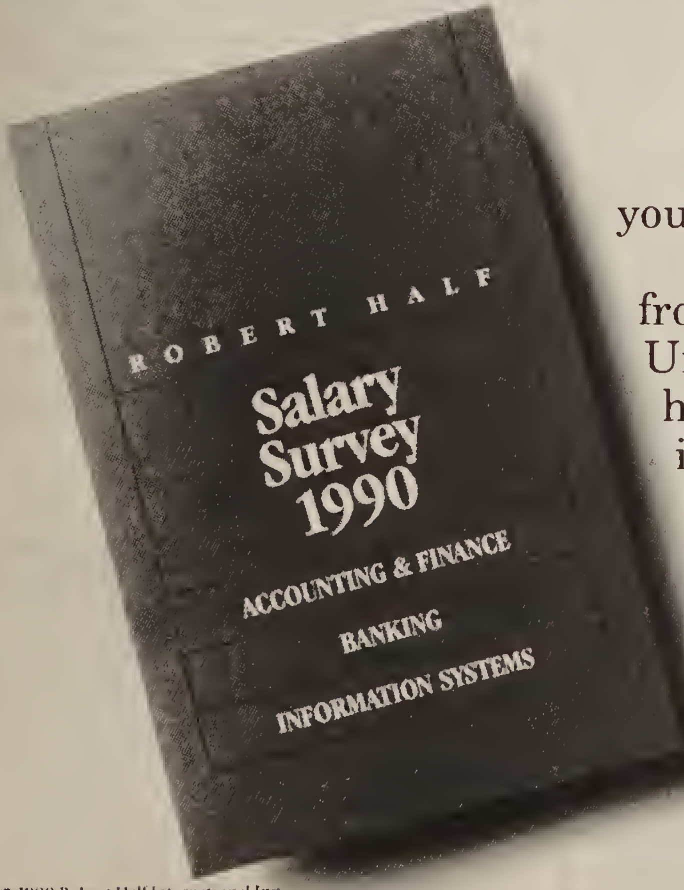

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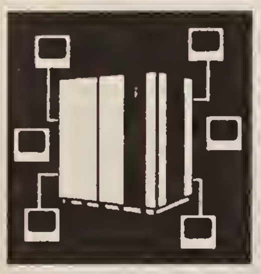

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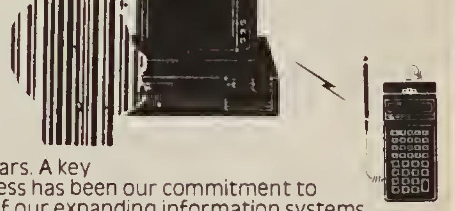

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Five years experience in analysis and programming financial applications on IBM mainframe systems with MVS/XA, COBOL, JCL, CICS, TSO/ISPF and VSAM. Experience with MSA systems preferred.

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Design, code, test, and document complex network system software. Requires detailed knowledge of TCP/IP and SNA protocols and Token Ring and Ethernet LAN technologies. Proven skill in developing and performing functional and stress testing of multiple complex networking systems components. Maintain avant-garde knowledge of networking technologies, products, architectures, protocols, and standards. **(Job #R-3531).**

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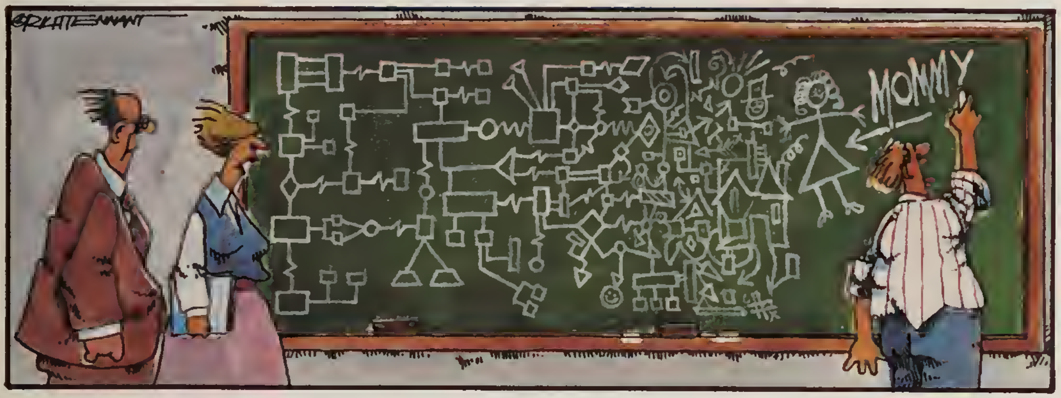

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   - **23.** Dir./Mgr. Sys. Development, Sys. Architecture
   - **31.** Mgrs., Suprv. of Programming, Software Dev.
   - **32.** Programmers, Software Developers

   OTHER COMPANY MANAGEMENT
   - **11.** President, Owner/Partner, General Mgr.
   - **12.** Vice President, Asst. VP
   - **13.** Treasurer, Controller, Financial Officer
   - **41.** Engineering, Scientific, R&D, Tech. Mgt.
   - **51.** Sales & Mktg. Management

   OTHER PROFESSIONALS
   - **60.** Sys. Integrators/VARs/Consulting Mgt.
   - **70.** Medical, Legal, Accounting Mgt.
   - **80.** Educator, Journalists, Librarians, Students
   - **90.** Others ____________ (Please specify)
3. **COMPUTER INVOLVEMENT** (Circle all that apply)
   Types of equipment with which you are personally involved either as a user, vendor, or consultant.
   - A. Mainframes/Superminis
   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
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Dr. Donald Zitter
Executive Director
University of Nevada System Computing Services
P.O. Box 9060
Reno, Nevada 89507

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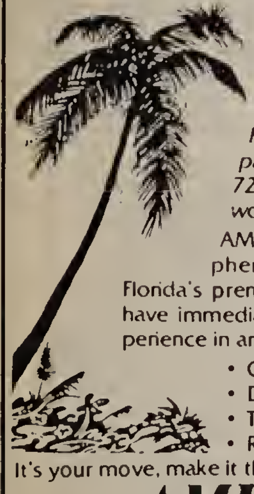

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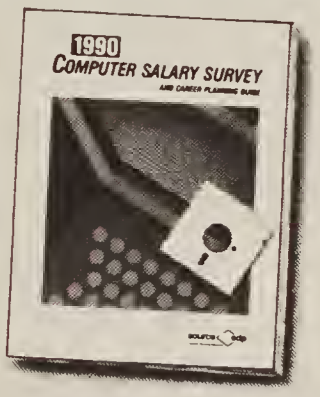

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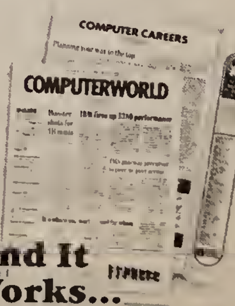

And It Works...

MARKETPLACE

The rewards of being ready

A few preparations before hiring a consultant can save your firm money

BY JANET RUHL
SPECIAL TO CW

When time is short, a computer consultant can be a cost-effective solution to the need for high-quality technical personnel. However, many consultants report that clients waste significant portions of their billable hours by neglecting to take a few preparatory steps. Information systems managers in the market for consultants should learn from these experiences. With computer consultants billing at anywhere from $35 to $200 an hour, it is worth taking the following steps before the consultant you hire arrives for work:

(1) Provide a functional working environment. Many consultants report that they have arrived at a new assignment only to find that no desk, phone or terminal is available for them. Some of them say they have had to spend hours scrounging for equipment and end up borrowing terminals from other staff members who are out of the office.

If consultants are expected to work on personal comuters, they should not have to spend time installing the company's standard software on them. This task should be handled by the in-house staff before the consultant arrives. The PC that the consultant is given should be configured in advance with any special hardware needed for the assignment, such as modems, local-area network cards and printers.

Before mainframe consultants arrive, the hiring manager should complete the paperwork needed to provide access to relevant test and production libraries. If this is not done, the consultant may have to sit for several days waiting for technical support personnel to process requests for passwords, access to special test queues, libraries and system commands.

It is also important to allocate permanent computer storage for the consultant's accounts. More than one consultant has been shocked to discover that the personal datasets used for storing specifications or code were purged at the end of the month because they were allocated on temporary packs.

If the company requires nondisclosure statements to be signed and processed before allowing consultants to work on company systems, this paperwork should be completed before the consultant's first day of work.

> TOO OFTEN, the consultant searching for the meaning of the code that controls the flow of a system is pointed toward the project library and told "it's in there somewhere."

(2) Explain the programming environment clearly. Every programming environment has its quirks, and it is unrealistic to expect the consultant to be aware of your shop's idiosyncrasies. In particular, you should make sure the consultant is informed of company coding standards.

Be sure someone technically competent explains the correct use of a project's libraries to consultants before they begin work. If the project uses boilerplate as a basis for new programs, specifications or other documentation, make sure the consultant realizes it and knows where to find the relevant files.

Finally, a pet peeve of many consultants is not being able to find software manuals in the client's office. Have the manuals available for all the systems software that the consultant will use. Data dictionaries and field descriptions are vital to consultants brought into the middle of a large project. Too often, the consultant searching for the meaning of the code that controls the flow of a system is pointed toward the project library and told "it's in there somewhere."

(3) Make people available to the consultant. A manager who brings in consultants should assign a technically competent project member to devote significant time to answering the consultant's questions during the first few days. All too often on busy projects, the only person whose time is not filled when the consultant arrives is new to the project and is still being oriented.

The person who orients the consultant should know not only technical issues but also the roles of people on the project and in the company, so the consultant knows who has the answers to different questions.

Managers who bring in consultants should make sure that users who will need to meet with the consultant are available upon his or her arrival. They should also inform people in other departments whom the consultant may approach for information.

(4) Have a clear idea of what the consultant is expected to accomplish. Consultants universally report that clients waste the most money because they rush to hire a consultant before adequately defining the problem they want solved. A computer consultant should not be expected to design a marketing system for a department that has not yet established a marketing plan, but many consultants say they are called in to do just this kind of work. Make sure that you have a clear idea, preferably in writing, of what you want the consultant to achieve before the billing clock starts ticking.

Ruhl is a consultant and programmer in Connecticut and author of *The Programmer's Survival Guide: Career Strategies for Computer Professionals.*

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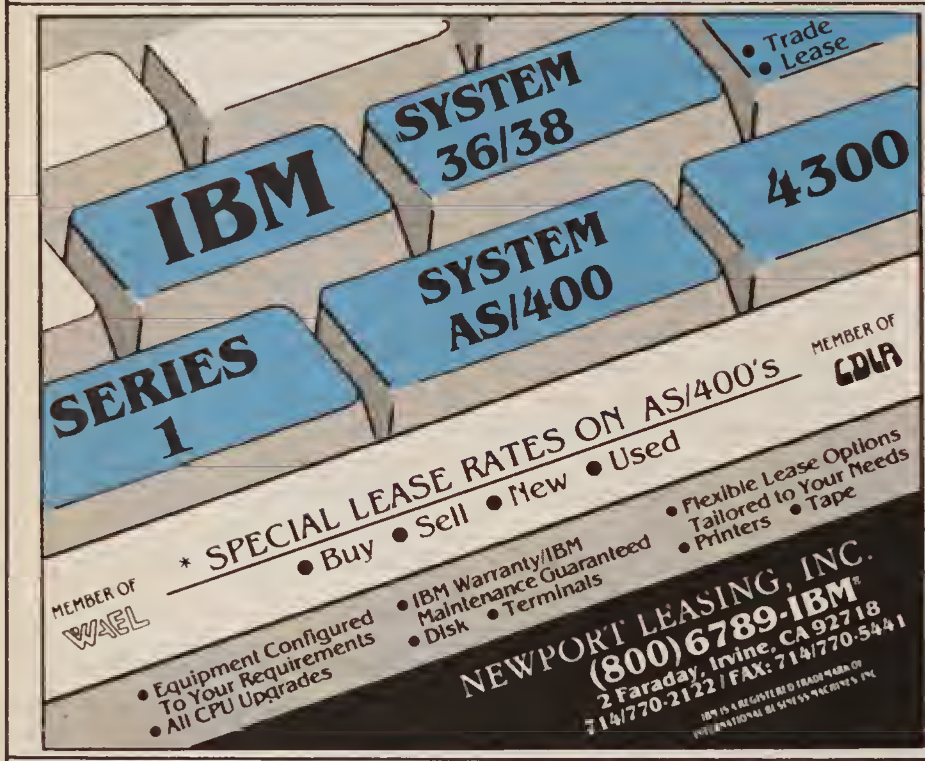

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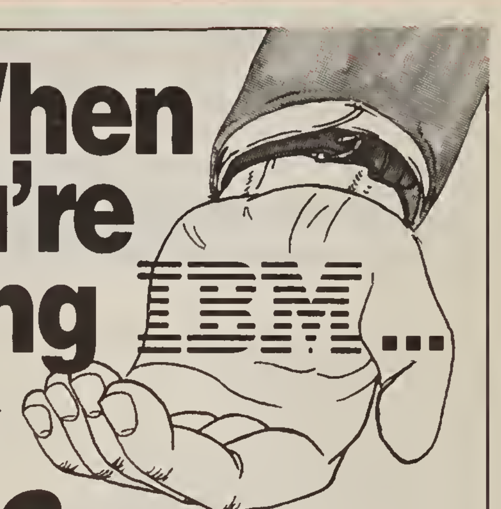

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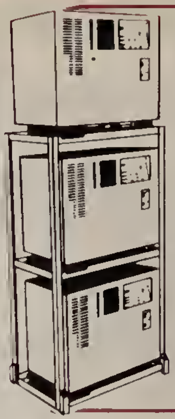

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PC users and the systems view

Teaching end users development principles helps prevent boondoggles

BY NAOMI KARTEN
SPECIAL TO CW

Most end-user training focuses on product features, functions and the technical aspects of making software work. However, too great an emphasis on product mechanics can leave end users with little or no understanding of application development.

Many users, for example, do not evaluate development options; instead, they simply reach for their spreadsheet regardless of the problem. Similarly, users sometimes fail to analyze the business implications of their applications. As a result, the application can fail to meet business needs and may need to be rewritten from scratch.

Product training should be viewed as one element of user training, not the sum total of such training. As more users learn to develop applications — increasingly complex applications — they also require an appreciation of some of the broader systems issues that information systems developers take for granted. Just as users need practice in product mechanics, they also need practice in analyzing business problems from a computer perspective — assessing development options, evaluating data needs, conducting thorough tests and evaluating the long-term implications of proposed systems.

Obviously, users do not need as detailed an exposure to these issues as do mainframe systems developers. What trainers should do is extract relevant issues from the IS environment and scale them down for end-user training. Since user-developed applications often lack the technical and organizational checks and balances of the mainframe world, trainers must also communicate standards and controls that are applicable to end users.

Users' lack of this broader perspective leads to real problems. In one case, for example, a user/analyst developed a monthly billing application with a fourth-generation language. It functioned properly for several months, but then the developer left the company. When the application was run a month later, it crashed. IS was called in to fix the problem, and found that the application was very complex, poorly coded, lacking in use of consistent techniques and, not surprisingly, undocumented. IS staff members had to hastily debug the system to get the bills out in time.

Stories of this kind reflect a lack of user awareness of the systems perspective and, in particular, a failure to analyze the consequences of a specific application decision. Training that zeros in on those consequences should include topics such as the following:

- **Problem analysis.** The training should aim at discouraging the "I need a spreadsheet" syndrome and giving guidelines for analyzing problems from a computer perspective.
- **Gauging the appropriateness of a system.** Users need help determining whether a particular problem calls for a computer solution or some other type of solution such as a change in management or organizational procedures.
- **Assessing feasibility.** Users can learn to estimate the scope of a development effort and to gauge whether they are capable of tackling it themselves.
- **Evaluating alternative solutions.** Users should settle on systems that have a high probability of working — not only on day one but over the long term. They should also learn how to correctly analyze the strengths and weaknesses of alternative systems.
- **Testing and validating applications.** Some users view an application as complete when the last calculation has been plugged in. They need to understand validation techniques that ensure that applications do only what they are supposed to do.

Training in the systems perspective is not specific to individual software packages. These topics can be adapted to classes for almost any application package, integrating them with product training. This approach will require the least amount of modification to the training curriculum.

An alternative route is to offer a course specifically designed to introduce the systems perspective. By including war stories and realistic exercises, it can give users a soup-to-nuts view of application development. They would develop an awareness of the risks and responsibilities of application development and be in a position to communicate this awareness to peers. Most importantly, however, users would gain insight into the consequences of their development decisions.

In numerous informal polls that I have conducted, almost all systems professionals have reported that they encountered errors in applications developed by users. Most respondents felt that there are probably many more unidentified errors lurking in the applications. Surprising though it may seem, every time a user completes a strictly product-oriented class, the potential for errors can increase. Training in the systems perspective is critical to the integrity of end-user computing.

Karten is president of Karten Associates in Randolph, Mass., and editor of the monthly newsletter "Managing End-User Computing."

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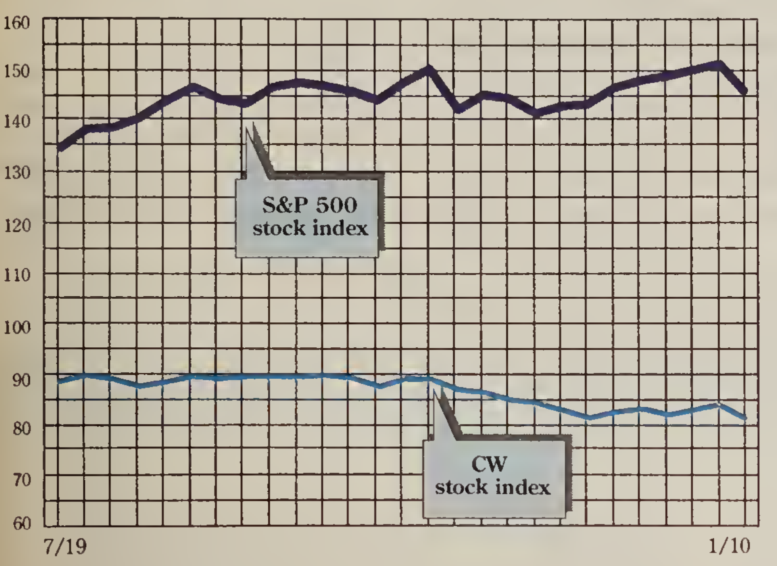

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Computer Systems	79.4	**76.9**
Software & DP Services	120.1	**117.6**
Semiconductors	52.6	**51.4**
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Leasing Companies	95.0	**91.3**
Composite Index	84.4	**82.2**
S&P 500 Index	151.7	**146.5**

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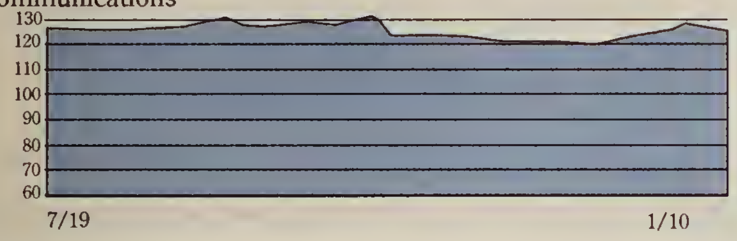

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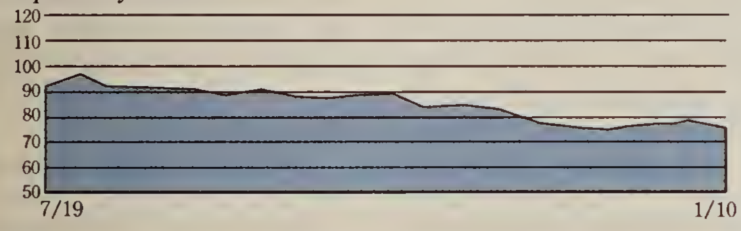

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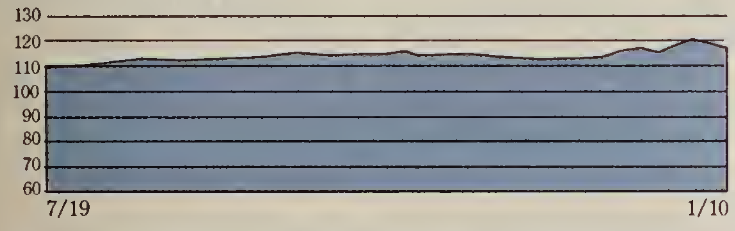

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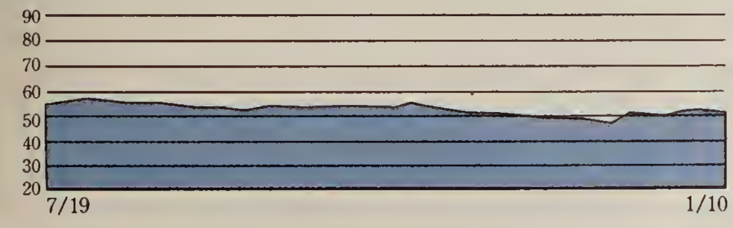

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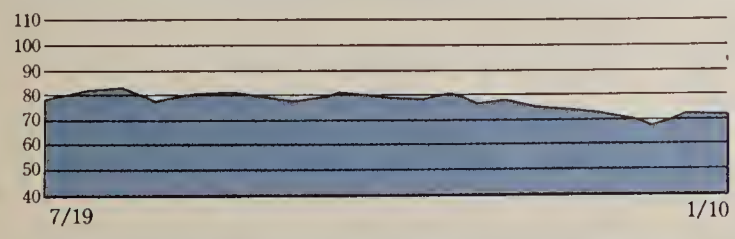

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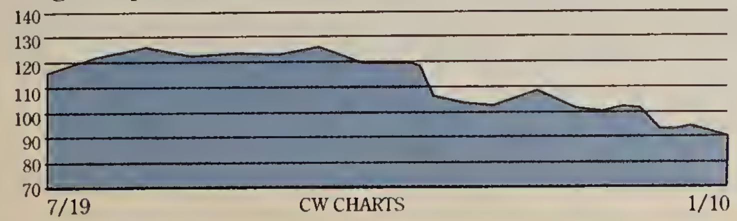

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CLOSING PRICES WEDNESDAY, JAN. 10, 1990

Communications and Network Services

EXCH		52-WEEK RANGE		PRICE CLOSE JAN. 10, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN INFO TECHS CORP	68	47	62.25	-4.5	-6.7
Q	ANDREW CORP	26	18	25.25	-0.5	-1.9
Q	ARTEL COMM CORP	9	2	8.375	1.3	17.5
N	AT&T	47	29	45	-1.1	-2.4
Q	AVANTEK INC	7	4	3.625	-0.4	-9.4
N	AYOIN CORP	21	14	15.25	-1.0	-6.2
N	8ELL ATLANTIC CORP	114	70	102	-11.8	-10.3
N	8ELLSOUTH CORP	59	39	54	-4.8	-8.1
Q	COMPRESSION LA8S INC	13	3	11.875	1.9	18.8
Q	CONTEL CORP	37	21	31.375	-3.6	-10.4
Q	DATA SWITCH CORP	6	2	3.375	-0.4	-10.0
Q	DIGITAL COMM ASSOC	26	17	22.375	1.8	8.5
Q	DYNATECH CORP	21	16	16.75	-0.3	-1.5
Q	FIBRONICS INTNL INC	7	4	6.25	0.1	2.0
Q	GANDALF TECHNOLOGIES	7	4	4.625	-0.4	-7.5
N	GENERAL DATACOMM INOS	7	4	4.75	0.1	2.7
N	GTE CORP	72	43	68.375	-2.6	-3.7
Q	INFOTRON SYS CORP	13	8	8	0.0	0.0
N	ITT CORP	65	51	56.5	-2.9	-4.8
N	M A COM INC	9	5	4.75	-0.3	-5.0
Q	MCI COMMUNICATIONS CORP	49	22	39.5	-3.6	-8.4
N	NETWORK EQUIP TECH INC	32	17	30.5	0.5	1.7
Q	NETWORK SYS CORP	10	7	8.75	0.6	7.7
N	NORTHERN TELECOM LTD	24	14	23.75	-0.4	-1.6
Q	NOVELL INC	38	24	31	-2.0	-6.1
N	NYNEX CORP	92	65	85.375	-4.1	-4.6
N	PACIFIC TELESIS GROUP	52	31	47.375	-3.3	-6.4
A	PENRIL CORP	9	4	6.875	-0.4	-5.2
N	SCIENTIFIC ATLANTA INC	25	13	23	-1.6	-6.6
N	SOUTHWESTERN 8ELL CORP	65	41	57.25	-6.4	-10.0
Q	3 COM CORP	29	10	13	-0.4	-2.8
N	U S WEST INC	81	57	74.625	-5.1	-6.4

Computer Systems

EXCH		52-WEEK RANGE		PRICE CLOSE JAN. 10, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
Q	ALLIANT COMPUTER SYS	7	3	5.75	-0.4	-6.1
Q	ALPHA MICROSYSTEMS	8	4	4.25	-0.1	-1.5
Q	ALTOS COMPUTER SYS	8	6	7.25	0.0	0.0
A	AMDAHL CORP	23	11	14.625	-1.3	-7.9
Q	APPLE COMPUTER INC	50	33	36	-1.5	-4.0
N	BOLT BERANEK & NEWMAN	11	6	6.875	-0.8	-9.8
N	COMPAQ COMPUTER CORP	113	61	84.25	-0.5	-0.6
N	COMMODORE INTNL	20	7	8.625	-1.8	-16.9
Q	COMPUTER AUTOMATION INC	6	2	3.25	-0.4	-10.3
N	CONTROL DATA CORP	24	16	17.75	0.0	0.0
N	CRAY RESH INC	66	31	37.25	-4.4	-10.5
Q	DAISY SYS CORP	7	0	0.688	0.0	0.0
N	DATA GEN CORP	20	12	11.5	-0.8	-6.1
N	DATAPOINT CORP	6	3	3.625	-0.1	-3.3
Q	OELL COMPUTER CORP	10	5	5.375	-0.1	-2.3
N	OIGITAL EQUIP CORP	122	80	87.5	1.6	1.9
N	FLOATING POINT SYS INC	4	1	1.5	-0.1	-7.7
N	HARRIS CORP	40	27	33.75	-0.3	-0.7
N	HEWLETT PACKARO CO	62	40	47	-1.5	-3.1
N	HONEYWELL INC	92	60	85.875	-1.3	-1.4
N	I8M	131	93	99	0.1	0.1
Q	INFORMATION INTL INC	16	12	12.75	-0.4	-2.9
Q	IPL SYS INC	9	5	6.625	0.6	10.4
N	MAI 8ASIC FOUR INC	11	3	2.875	-0.1	-4.2
N	MATSUSHITA ELEC INOL LTO	197	154	163	0.5	0.3
Q	MENTOR GRAPHICS CORP	22	13	17	-0.1	-0.7
N	NBI INC	3	0	0.406	0.0	8.3
N	NCR CORP	67	53	62.875	2.8	4.6
N	PRIME COMPUTER INC	21	6	7.25	0.4	5.5
Q	PYRAMIO TECHNOLOGY	23	9	21.25	1.3	6.3
Q	SEQUENT COMP SYS INC	23	9	20.75	0.5	2.5
Q	SHARE8ASE CORP	4	0	0.313	0.0	0.0
Q	SILICON GRAPHICS CORP	29	14	26.5	-2.5	-8.6
Q	SUN MICROSYSTEM INC	23	13	16.375	-1.6	-9.0
Q	SYM8OLICS INC	3	1	0.938	-0.4	-31.8
N	TANOEM COMPUTERS INC	26	15	25.125	-0.1	-0.5
N	TANOY CORP	49	37	38	-1.9	-4.7
N	ULTIMATE CORP	12	7	8.375	-0.3	-2.9
N	UNISYS CORP	31	12	14.875	-0.4	-2.5
A	WANG LABS INC	11	5	4.5	-0.5	-10.0

Software & DP Services

EXCH		52-WEEK RANGE		PRICE CLOSE JAN. 10, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
Q	AMERICAN MGMT SYS INC	19	11	12.25	0.3	2.1
Q	AMERICAN SOFTWARE INC	23	11	22.25	-0.4	-1.7
N	ANACOMP INC	8	4	4.25	-0.4	-8.1
Q	ANALYSTS INTL CORP	20	10	16.5	-0.5	-2.9
Q	ASHTON TATE	24	9	11.125	-1.6	-12.7
Q	ASK COMPUTER SYS INC	18	7	8	-0.8	-8.6
N	AUTO DATA PROCESSING	51	36	47.75	-1.9	-3.8
Q	AUTODESK INC	44	27	39.75	-1.5	-3.6
Q	8MC SOFTWARE INC	33	14	30.5	-2.1	-6.5
N	8USINESSLANO INC	15	8	7.75	-0.5	-6.1
Q	COGNOS INC	9	4	4.625	-0.3	-5.1
N	COMPUTER ASSOC INTL INC	22	11	12	-1.0	-7.7
Q	COMPUTER HORIZONS CORP	11	7	8.625	-0.5	-5.5
N	COMPUTER SCIENCES CORP	59	47	57.75	0.5	0.9
N	COMPUTER TASK GROUP INC	16	9	9.375	0.1	1.4
Q	COMSHARE INC	42	21	36.5	-1.0	-2.7
Q	CORPORATE SOFTWARE	16	9	10.375	0.4	3.8
N	GENERAL MTRS (CLS E)	58	43	53.375	-1.4	-2.5
Q	HOGAN SYS INC	7	4	4.125	0.1	3.1
Q	INFORMIX CORP	16	8	14.75	-1.3	-7.8
Q	INTELLICORP INC	6	3	4.75	0.1	2.7
Q	LEGENT CORP	32	21	28	0.8	2.8
Q	LOTUS DEV CORP	34	19	28.5	-3.3	-10.2
Q	MICROSOFT CORP	92	46	88.25	-1.0	-1.1
Q	NATIONAL DATA CORP	35	23	33	-1.3	-3.6
N	ON LINE SOFTWARE INTL INC	10	5	10.375	0.4	3.8
Q	ORACLE SYS CORP	26	10	19.5	-2.0	-9.3
N	PANSOPHIC SYS INC	19	12	16.75	-0.4	-2.2
Q	PHOENIX TECHNOLOGIES INC	19	3	4	0.0	0.0
Q	POLICY MGMT SYS CORP	38	22	34	-1.0	-2.9
Q	PROGRAMMING & SYS INC	22	16	22	0.0	0.0
Q	RELATIONAL TECH INC	16	5	7.875	0.0	0.0
N	REYNOLDS & REYNOLDS CO	34	22	22.25	-1.9	-7.8
Q	SAGE SOFTWARE INC	11	7	8.875	-0.5	-5.3
Q	SEI CORP	20	16	18.75	1.3	7.1
Q	SHAREO MEO SYS CORP	19	12	13.25	0.1	1.0
Q	SOFTWARE PU8G CORP	21	10	16.75	0.0	0.0
A	STERLING SOFTWARE INC	9	5	9	-0.1	-1.4
Q	SUNGARO OATA SYS INC	26	13	24.625	0.3	1.0
Q	SYSTEMATICS INC	40	30	36.25	0.0	0.0
N	SYSTEM CENTER INC	26	17	22.75	-0.6	-2.7
N	SYS. SOFT INC	33	18	31.25	0.5	1.6
Q	WOROSTAR	3	1	1.188	-0.3	-20.8

Semiconductors

EXCH		52-WEEK RANGE		PRICE CLOSE JAN. 10, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
N	AOV MICRO DEVICES INC	11	7	7.625	-0.4	-4.7
N	ANALOG OEVICES INC	13	8	9	-0.1	-1.4
Q	ANALOGIC CORP	11	8	9.75	0.1	1.3
Q	CHIPS & TECHNOLOGIES INC	26	14	16.375	-1.6	-9.0
Q	INTEL CORP	38	23	36	1.0	2.9
Q	MICRON TECHNOLOGY INC	26	9	9.875	-0.4	-3.7
N	MOTOROLA INC	64	40	61.25	-1.3	-2.0
N	NATL SEMICONDUCTOR	9	6	6.625	-0.4	-5.4
N	TEXAS INSTRS INC	47	28	36.125	-0.9	-2.4
A	WESTERN OIGITAL CORP	15	6	9	-0.1	-1.4

Peripherals

EXCH		52-WEEK RANGE		PRICE CLOSE JAN. 10, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
Q	ALLOY COMP	3	1	1.125	0.0	0.0
N	AM INTL INC	6	4	3.875	-0.3	-6.1
Q	AST RESH INC	15	7	13.625	2.5	22.5
Q	AUTO TROL TECH CORP	6	4	4	0.0	0.0
Q	8ANCTEC INC	20	10	15.125	-0.6	-4.0
Q	CIPHER DATA PROOS INC	11	4	6.625	-0.4	-5.4
A	COGNITRONICS CORP	8	2	5.75	-0.4	-6.1
Q	CONNOR PERIPHERALS	16	7	13.25	0.0	0.0
A	DATAPROOUCTS CORP	18	8	7.875	-0.8	-8.7
A	DATARAM CORP	12	7	9.375	-0.3	-2.6
N	EASTMAN KOOAK CO	52	40	42.25	-0.6	-1.5
N	E M C CORP MASS	6	3	3.625	-0.4	-9.4
Q	EMULEX CORP	12	5	6.125	-0.3	-3.9
Q	EVANS & SUTHERLANO	25	15	21.75	-2.0	-8.4
Q	ICOT CORP	3	1	1.25	-0.1	-9.1
Q	INTERLEAF INC	10	5	6.25	-0.6	-9.1
Q	IOMEGA CORP	4	2	3.313	0.1	3.9
Q	LEE OATA CORP	4	1	1.938	0.4	24.0
Q	MASSTOR SYS CORP	4	2	2.25	-0.1	-2.7
Q	MAXTOR CORP	12	8	8.125	-0.9	-9.7
Q	MICROPOLIS CORP	8	3	4	0.4	10.3
Q	MINISCRI8E CORP	8	0	0.313	0.0	-9.0
N	MINNESOTA MNG & MFG CO	84	61	82.25	0.9	1.1
Q	PERSONAL COMP PROOUCTS INC	6	4	3.875	-0.1	-1.6
Q	PRINTRONIX INC	10	7	10	0.1	1.3
N	QMS INC	13	7	11.875	-0.5	-4.0
Q	QUANTUM CORP	17	4	12.25	0.8	6.5
N	RECOGNITION EQUIP INC	13	6	7.25	0.1	1.8
Q	REXON INC	8	6	6.75	-0.3	-3.6
Q	SEAGATE TECHNOLOGY	16	9	15.625	-0.3	-1.6
N	STORAGE TECH CORP	23	9	13.875	1.9	15.6
Q	TANDON CORP	1	0	0.688	-0.1	-15.4
N	TEKTRONIX INC	24	16	18	0.0	0.0
Q	TELEVIDEO SYS INC	1	0	0.25	-0.1	-20.1
N	XEROX CORP	69	54	56.75	-1.5	-2.6

Leasing Companies

EXCH		52-WEEK RANGE		PRICE CLOSE JAN. 10, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
Q	AMPLICON INC	115	10	10	-1.0	-9.1
N	CAPITAL ASSOC INTNL INC	9	4	4	-0.5	-11.1
N	COMDISCO INC	34	21	24.5	-0.3	-1.0
Q	CONTINENTAL INFO SYS	2	0	0.234	0.0	-6.4
Q	LDI CORPORATION	18	12	16	0.3	1.6
Q	PHOENIX AMERN INC	5	3	3.375	-0.3	-6.9
Q	SELECTERM INC	9	5	6.25	0.0	0.0

EXCH: N = NEW YORK; A = AMERICAN; Q = NATIONAL

Worry days

Disappointing third quarter makes investors dread fourth

A nasty bout of deja vu triggered investor qualms last week; typically, technology stocks were among the first to feel the fallout.

"The common theme that's developing right now is that if we were disappointed in the third quarter, we're going to be disappointed again in the fourth," said Charlotte Walker, an analyst at County Natwest USA.

Compaq Computer Corp., a gainer early in the week, dropped 1⅜ points to a Thursday close at 82⅞. Hewlett-Packard Co., also backsliding from a strong start, finished the week at 46⅞, down ½ a point. Apple Computer, Inc. slid 3¼ points to close at 34½.

Microsoft Corp.'s 3⅛-point tumble to 86½, hot on the heels of a new 52-week high a week earlier, marked no more than a consolidating trend in the wake of the stock's "parabolic rise during the autumn months, based largely on unrealistic expectations," Walker said.

Intel Corp.'s supercomputer market debut buoyed the company's stock ½ a point to 36; however, the new kid in town chased 4⅛ points away from Cray Research, Inc.'s start on Monday at 41⅝.

IBM ended the week at 99⅞, up ⅛ of a point. Digital Equipment Corp. picked up 1½ points, closing on Thursday at 87¾.

NELL MARGOLIS

Million-dollar

FROM PAGE 1

As a result, said Herb Halbrecht, president at Halbrecht Associates, executive recruiters in Stamford, Conn., "the compensation levels are going very high."

Recruiters said that demand has outstripped supply for IS executives with strong business backgrounds. "People who see how technology can provide business solutions are very rare," said Boston-based consultant Tom Wilson at the Hay Group.

> "PEOPLE WHO see how technology can provide business solutions are very rare."
>
> TOM WILSON
> HAY GROUP

The sudden surge in compensation suggests that other CIOs could see their salaries rise dramatically if they succeed in bringing added value to their organization.

The CIO slots at Sears Roebuck and Co., Aetna Life & Casualty Co., ITT Corp., United Technologies Corp. and Texas Air's System One Corp. are said by recruiters to be worth $300,000 to $450,000 annually.

Most CIOs declined to comment on salary specifics. John Singleton at Security Pacific responded through a spokesman that the estimate of his salary was inaccurate but declined to specify.

Bankamerica Corp. Executive Vice-President Michael Simmons, who confirmed he is earning in the $400,000 range, said, "There are several people at my level making over $500,000 a year in total annual compensation."

Cream of the crop

According to executive recruiters Heidrick and Struggles, Inc., the top 2% of CIOs are raking in more than $400,000 annually. They include mostly IS executives at Fortune 500 firms in such information-intensive industries as securities, retail, banking, insurance and transportation. Survey data also shows that these industries are paying above-average salaries for other IS staff positions.

In other business sectors, CIOs who have succeeded in implementing innovative uses of IS are also cashing in on their efforts. Federal Express Corp.'s Ron Ponder and Baxter International, Inc.'s Michael Heschel, for example, are said to earn between $250,000 and $350,000 annually.

These numbers contrast sharply with the $89,000 average annual compensation for CIOs and vice-presidents for IS found in a *Computerworld* IS salary survey reported last year [CW, Sept. 4] as well as the somewhat higher $123,000 figure found in a similar study by compensation specialists Mercer Meidinger Hansen. Clearly, pay packages of the top CIO money-earners skew far from the mean.

Those IS chiefs collecting compensation that is far above average have penetrated the corporate elite entitled to six-digit bonuses, stock options and other salary enhancements. "They want parity with what other senior executives are making," Heidrick and Struggles' Robert Walsh said.

At the upper limits of CIO compensation, the split between base and bonus often shifts significantly in favor of the latter. Peterson's incentive bonus between 1986 and 1988, for example, totaled a cool $1.7 million, according to Merrill Lynch's proxy statements.

American Airline's Senior Vice-President Max Hopper earned a base salary in 1988 of $270,000, his company's reports show. His incentive bonus increased that figure by 56%, or $150,000. By comparison, the average bonus for CIOs was only 25% of base, according to the Mercer Meidinger Hansen survey.

Proportions, of course, vary according to industries and individual firms. Elaine Bond, whose compensation as senior vice-president of corporate systems at The Chase Manhattan Bank has been estimated in the $300,000 to $400,000 range, said her annual bonuses have stayed between 20% and 30% of base salary.

The lucrative pay, CIOs said, heralds the end of the days when computing and communications were considered the arcane business of the boiler room, and those sweating there were left unseen and forgotten.

In fact, several CIOs at major companies — including Peterson, Simmons, Hopper and Singleton — have achieved unusually high positions within their companies' organizational pyramids. And their salaries reflect their new status.

Simmons reports to Bankamerica's chairman and is one of eight members of the company's management committee. Singleton is a member of the Office of the Chairman at Los Angeles-based Security Pacific.

Hand in hand with the higher pay, of course, comes greater pressure to perform. IS executives must now share the profit-making responsibilities traditionally shouldered by the chiefs of marketing, finance and operations. Gone are the days when it was enough to be on time and under budget. Companies paying an executive half a million dollars or more each year expect a return on their investment.

Successful CIOs, however, cite the ego gratification — the "psychic salary," said one — resulting from easier access to top management and growing recognition of their contribution to corporate profitability as significant newfound rewards of their jobs.

Lucrative life

Estimated compensation — excluding deferred compensation, such as stock options — at 19 major U.S. companies reflects a hefty total of salary and cash incentives for top CIOs

COMPANY	CURRENT CIO	1988 TOTAL COMPENSATION*
Merrill Lynch & Co.	DuWayne Peterson	$1,000,000
Salomon Brothers, Inc.	Francis Dramis	$750,000 - $850,000
Morgan Stanley Group, Inc.	Bob Gartland	$700,000 - $800,000
Drexel Burnham Lambert, Inc.	Joseph Castellano	$700,000 - $800,000
Goldman, Sachs & Co.	Rick Adam	$700,000 - $800,000
CS First Boston, Inc.	Eugene Bedell	$700,000 - $800,000
Security Pacific Corp.	John Singleton	$450,000 - $550,000
Citibank	Paul Glaser	$400,000 - $500,000
American Airlines	Max Hopper	$420,000
Aetna Life & Casualty Co.	John Loewenberg	$350,000 - $450,000
Bankamerica Corp.	Michael Simmons	$350,000 - $450,000
ITT Corp.	Leo Heile	$350,000 - $450,000
The Coca-Cola Co.	Kenneth Chevis	$350,000 - $450,000
United Technologies Corp.	John Hammitt	$300,000 - $400,000
Sears, Roebuck and Co.	Charles Carlson	$300,000 - $400,000
The Chase Manhattan Bank	Elaine Bond	$300,000 - $400,000
Federal Express Corp.	Ron Ponder	$250,000 - $350,000
Baxter International, Inc.	Michael Heschel	$250,000 - $350,000
Lincoln National Corp.	David Allen	$200,000 - $300,000

*Merrill Lynch and American Airlines figures are from annual proxy statements. All others are estimates based on salary survey data, interviews with CIOs and executive recruiters and extrapolations from corporate executive compensation reports.

CW CHART: DOREEN DAHLE

There's gold in them thar CIOs!

When negotiating pay packages, a growing number of CIOs are looking beyond base salary and bonus. "Building an estate" and "growing net worth" become operative goals for executives cashing paychecks that exceed $30,000 per month.

"You start looking at the long term," said Drexel Burnham Lambert, Inc.'s information systems chief, Joseph Castellano.

In fact, 35% of CIOs are now offered deferred compensation in the form of stock options, stock bonuses or preferred shares, according to The Survey Group, compensation specialists based in Wakefield, Mass. For top money-makers, this can boost earnings into an even higher quantum of wealth.

For example, DuWayne Peterson, executive vice-president of IS at Merrill Lynch & Co. and one of the company's seven senior officers, was granted 36,700 restricted shares between 1986 and 1988, according to corporate financial data released under Securities and Exchange Commission guidelines. Restricted shares become common stock at the end of a predetermined vesting period, typically between one and five years. At current market rates, Peterson's shares are now worth close to $1 million.

In February 1989, he was also granted nonqualified stock options to purchase 60,000 shares at a price of $29.40 per share, exercisable over the next four years.

Max Hopper, American Airline's fourth-highest paid executive, received stock options between 1986 and 1988 to buy 5,000 shares at $40.90 per share and 2,000 restricted shares, financial records published by the company reveal. He already holds 6,000 shares whose restrictions have lapsed and 10,000 shares of deferred stock. At the current market value, the restricted and deferred stock Hopper holds would be worth more than $1 million.

Some companies offer interest-free loans to senior executives wishing to exercise stock options. The interest saved on the loan is tantamount to a bonus. Thanks to such a plan, Ron Ponder, senior vice-president in charge of IS at Federal Express Corp. in Memphis, has borrowed $702,314, according to the company's financial statements.

Leading IS executives also benefit from a large upfront signing bonus when hired that can equal up to half a year's salary, according to Bruce Walton, CIO recruitment specialist at Russel Reynolds Associates, Inc. in Boston. Golden parachutes, a guaranteed severance bonus reserved for top corporate officers, are also becoming typical for CIOs, he adds.

At Bankamerica Corp., Michael Simmons' contract stipulates that the IS executive could receive three times his annual compensation, which is estimated to be about $400,000, if management control of the firm changes hands, according to corporate financial records.

In addition to the monetary benefits, perquisites can include company cars, extended vacations, free financial counseling, access to a health club and additional insurance coverage.

AMIEL KORNEL

CASE

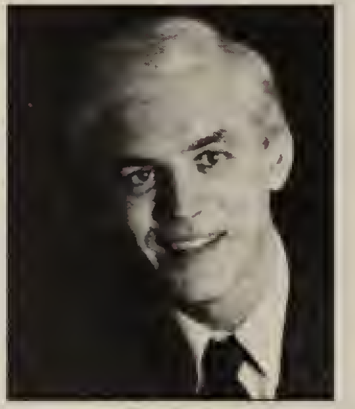
FROM PAGE 1

Merlyn, chairman of Bellevue, Wash.-based CASE Research, Inc.

Several sources who have worked for and with Orr over the years recalled a successful consultant turned reluctant executive.

"He never wanted to leave Topeka in the first place," said Leon Stucki, himself the president of a CASE tool vendor firm and a longtime Orr business associate.

But the daily uncertainties of consulting, he said, left Orr open to friends' urging that he parlay his successful CASE consulting and training practice into a company offering front-end software design automation tools.


Orr bows out
of CASE venture

Largely at the urging of James Whitely, the venture capitalist and a longtime Orr friend and business associate who co-founded and helped fund Optima, Orr brought in Palmer, whose roots were in software marketing and consulting, as the first chief executive officer. However, things did not go smoothly.

"It became pretty clear almost right away that she and I didn't see eye to eye on almost anything," Orr said.

"There was clearly a values collision," Palmer said.

They agreed on little else, starting with where to base the company. Palmer, convinced that only an urban center offered the resources necessary to launch a successful company, opted for a suburban Chicago headquarters. Orr manned his post of chairman and chief scientist from his Topeka base.

"When Ken said, 'Let's just leave the development group in Kansas,' " Palmer recalled, "that was probably the beginning of the end. That was the road to nowhere." Orr said Optima was able to last as long as it did because of his decision to shield Optima's technology arm from the urban, fast-track, venture capital culture that he said was Palmer's undoing.

In recognizing his own potential limits as a CEO, Orr avoided a pitfall that has tripped many a thinker on his way into the world of commerce. Ironically, it was apparently the last pitfall the fledgling Optima did avoid.

In short order, according to the accounts of numerous sources, practically everything that could go wrong did.

The original, homegrown Optima tool, said a technical consultant who worked closely with the company, "was not well engineered; it was very slow, and the data dictionary was incomplete."

In addition, said the technical consultant, the Orr methodology, which had — and still has — its devout adherents, met with resistance when it entered the commercial mainstream. "Orr wasn't the household name that Gane and Sarson, or Yourdon and DeMarco, were," the consultant said.

Optima's long-term relationship with Pacific Bell ("our major client, almost a silent partner," according to Palmer) fell victim to Pacific Bell's own internal reorganization and decision to focus on core businesses.

Of all the problems that came cannonballing at Optima, however, none was more ultimately destructive than the dissent that permeated its management team from day one.

Orr paints a picture of Palmer as having been lured — as are so many start-up executives — by seemingly ready venture funding and then driven into a spate of overexpansion by its demands for an early return on investment. "Venture capital is a lot like steroids," he said. "You get pumped up artificially; then you get overly aggressive; then you get paranoid."

Orr claimed that Palmer squandered hard-won capital on glitzy offices and trappings and invested in an expensive sales force before there were sufficient products to sell.

True on bare facts, said Palmer — but wrong and wrong again on interpretation. By her own account, her expertise produced generous discounts and clever deals that enabled her to create the "look and feel" of a successful company on a virtual shoestring. "Offices" that she opened in New York, Texas and San Francisco, she said, were merely mailing addresses or, in one case, a budget-wise space-sharing arrangement.

In the mid-1980s, Palmer noted, CASE was a relatively new concept and a distinctly difficult sell. "You can't just drop a product like that in distributors' laps," she said. "They won't understand it. This means you're looking at the most expensive sales setup in the industry: direct sales to the Fortune 500."

"That's fine," Stucki said, "if you have the resources." Optima did not.

An approximately $800,000 first round of venture capital quickly disappeared and a hoped-for second round never materialized. Optima's money began running out just in time to send its executives scurrying for capital "at the end of 1987 — just around Wall Street's Black Monday," said the technical consultant.

Even with this litany of woes, Merlyn said, Optima might have been able to bootstrap itself into a new and stronger start had it been in an industry niche that was not itself going through a wrenching transition.

Optima's customers are unlikely to find themselves left in the lurch, however. Although the company is gone, at least two firms are currently claiming rights to market its tools.

Orr, still head of the Topeka-based Ken Orr Institute, is again happily immersed in a combination of academics: He holds an associate professorship at Washington University in St. Louis and is involved in corporate consulting, including work with IBM "doing AD/Cycle explaining conferences around the world."

Palmer still laments Optima's crash on takeoff. "We could have made a difference," she said.

Prisoners nab payroll password

BY RICHARD PASTORE
CW STAFF

NASHVILLE — Some critics charge that putting computers in the hands of convicted criminals is like giving Pandora your password. Such fears rang true last month at the Tennessee State Prison, where inmates working as data-entry operators gained access to the payroll system and gave themselves unauthorized raises.

As many as 18 inmates, who had been earning 10 cents per 1,000 keystrokes entering state agency data into the prison's 13-year-old Motorola, Inc. host, allegedly finagled with the payroll system to artificially inflate their keystroke tallies. The resulting bonuses in the inmates' December paychecks ranged from $20 to $500 per person, according to a Department of Corrections spokesman.

Officials got wise to the ruse when a computerized audit automatically flagged the abnormally high keystroke totals.

Although the scam was exposed, the fact that it happened reinforces the arguments of critics that have labeled such programs too risky. At Washington's state prison, security issues were cited as one reason for suspending an innovative program last year in which inmates kept personal computers in their cells [CW, July 24, 1989].

In Nashville, prison officials have stopped short of canceling the data-entry enterprise program. "Just because you have a problem develop, you can't just quit it; you have to repair it," said Tom Mathis, director of the prison's Correctional Enterprises program.

The need to teach prisoners work skills and ethics outweighs the risk, Mathis said, adding that such abuses also occur among bank employees and at other private sector companies. "There's room for abuse even in a game of checkers," he said.

The prison is not playing games with system security, however. Officials wasted no time in yanking payroll from the system and moving it to an outside accounting office. "The inmates will no longer have access to it," a spokesman said.

In addition, passwords that were previously changed once a month will now be altered weekly. Mathis added that the Motorola machine is isolated and not connected to any other state system.

An ongoing internal investigation is seeking to learn how the inmates discovered the password and how many of the 18 actually made the changes.

Meanwhile, the prisoners' ill-gotten Christmas bonuses will have to be returned. "We are requesting that they withdraw the money from their trust fund accounts and refund it to us," Mathis said. "If they don't, then we'll take whatever legal action is necessary to recover," as well as disciplinary action.

One bad worm spoils whole bunch of Apple Macintoshes

BY JAMES DALY
CW STAFF

A virus that can freeze files, distort printer fonts, crash applications and ultimately prevent computers from starting is rapidly spreading through Apple Computer, Inc. Macintosh computers in the U.S. and Europe.

The two strains of the virus — known as WDEF A and WDEF B — were discovered early last month by programmers in Belgium and at Northwestern University in Chicago when attempts to load floppy disk-based programs onto a Macintosh IICI were met with incessant system crashes.

"It's a relatively short and simple virus, but it's got some very nasty bugs in it," said John Norstad, an analyst at the academic computing center at Northwestern. The Macintosh IICI and Portable are the most vulnerable, Norstad added. Simply loading an infected disk onto these systems can cause a crash.

Since the discovery of WDEF, most of the popular antivirus software makers have created updates to detect and eradicate the problem. Norstad said the virus can also be removed by rebooting the system while holding down the option and command keys on the keyboard, but warned that re-infection could occur if a new disk with the virus entered the system.

Norstad said he has received "hundreds of reports" of the virus, which infects the invisible Desktop files used by the Finder, which helps the Mac manage files and folders. WDEF does not infect document files, applications or other system files.

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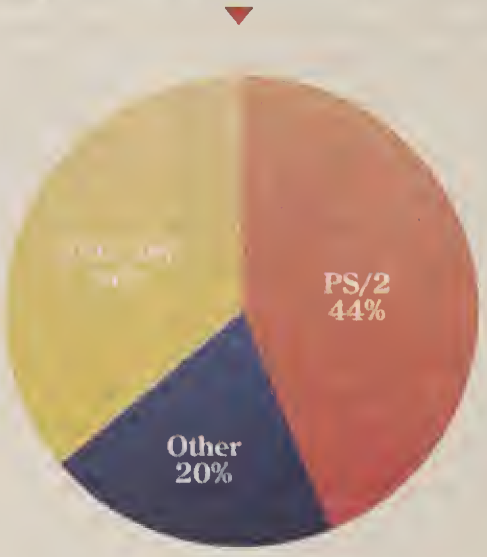
TRENDS

After three years on the market, the PS/2 may not qualify as an official "industry standard," but it has succeeded in making a large enough impact to divide the PC market in two.

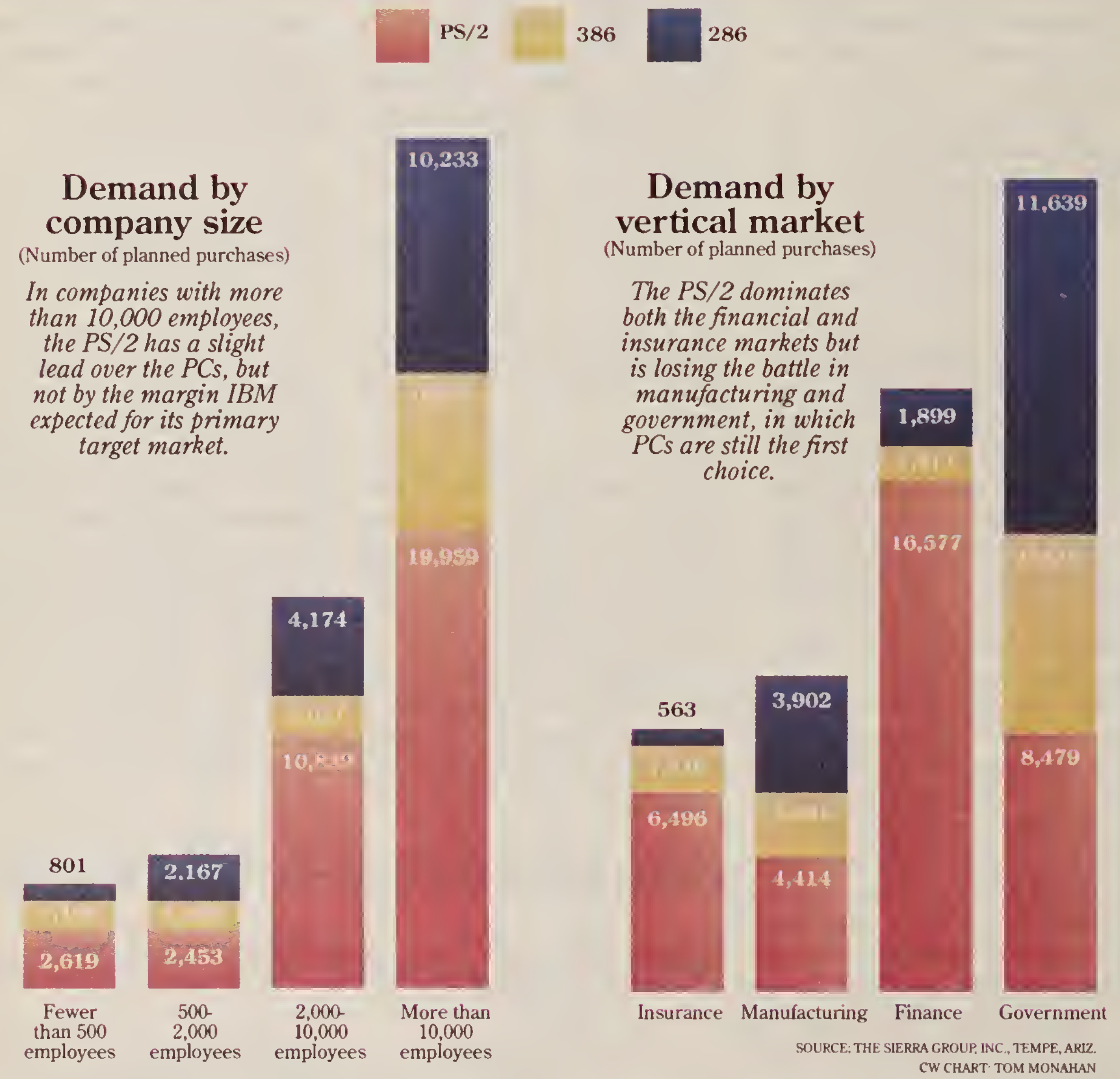
(Figures based on a survey of approximately 1,200 sites)

Buying plans

The PS/2 appears to have overcome the dominance of PCs as the No. 1 choice among the survey respondents.



Percent of unit purchases (Total: 82,393)



Demand by company size

(Number of planned purchases)

In companies with more than 10,000 employees, the PS/2 has a slight lead over the PCs, but not by the margin IBM expected for its primary target market.

Demand by vertical market

(Number of planned purchases)

The PS/2 dominates both the financial and insurance markets but is losing the battle in manufacturing and government, in which PCs are still the first choice.

SOURCE: THE SIERRA GROUP, INC., TEMPE, ARIZ.
CW CHART: TOM MONAHAN

NEXT WEEK

The National Football League's IS quarterback is a native New Yorker who "likes to solve problems" and who, over the course of six years, has led the league far downfield in computer technology.

Manager's Journal kicks off Super Bowl week with a profile of **Mary Oliveti**, the NFL's manager of information processing.

ANDY FREEBERG

"Improve it or they'll remove it!" will be the watchword for the 1990s, says industry pioneer John Diebold, whose forthcoming book, *The Innovators,* is excerpted in the In Depth section. The technical innovations he addresses are all from the past, but in this section, he isolates unchanging elements of innovation that we'll need in the future.

INSIDE LINES

Dear diary . . .

Robert T. Morris Jr. has received several book offers, according to his attorney Thomas Guidoboni, but Morris has no plans to write a book. However, Anne Morris, his mother, has been busily taking notes during the trial and said she is compiling a personal record for family members. Meanwhile, during one of the frequent smoking breaks outside the courtroom, Robert T. Morris Sr. bumped into Cornell's Dean Krafft, a key prosecution witness, walking out after concluding his day-long testimony. "What can I say?" said a smiling Morris Sr. to Krafft. "I'm glad to meet you again," replied Krafft, somewhat ruefully. "I only wish that it had been under other circumstances."

A worldly view

IBM is hoping that a trio of third-party Netview/PC application generators, which it plans to announce within a month, will generate some much-needed support for the Netview interface. Products from Diederich & Associates, Applied Systems Technologies, Inc. and Kaptronix, Inc. will make it easier to develop Netview/PC applications for non-IBM networking devices, an IBM spokesman said.

When East meets West

On Wednesday, Groupe Bull and its new subsidiary, Zenith Data Systems, will announce a series of products using the Extended Industry Standard Architecture bus, Intel's I486 chip and multiprocessing technology. Groupe Bull Chairman and proud new Zenith parent Francis Lorentz will fly in from France to host the event. Bull is hoping to use its $7 billion sales leverage to carve out a chunk of the Eastern European market, using the new Zenith line as bait.

Dress for success . . .

AT&T's Unix Software Operation plans to debut transaction-processing software targeted at commercial users. The product, called Tuxedo, was developed and marketed without much success by AT&T's Computer Systems Group. But USO hopes the enhancements it has made, such as LAN support and an unbundling of the product, will transform it into a winner.

Who speaks for whom?

Sun Microsystems has added another $66 million in long-term debt financing, less than a month after Austin Mayer, head of investor relations, said the company would not seek funding for at least a year. Since September, Sun has assumed more than $320 million in debt financing. Although most analysts are still bullish on the company, it's got to make you wonder whether new CFO Bill Raduchel is having second thoughts.

Rolling sevens

The arrival date of Apple's System 7.0 moves so often it seems like it's on wheels. First, it was the first quarter of this year. Now, Apple says to look for it in the "summer 1990 time frame." But there is talk that it may drag out until the frost is on the pumpkin. Stay tuned.

Talk softly and carry big MIPS

On Jan. 18, Control Data is scheduled to announce a new line of workstations based on the Mips Computer reduced instruction set computing line. The workstations, which will not carry CDC's Cyber name as do the high-end workstations that are built for it by Silicon Graphics, will be sold as stand-alone machines and will also be configured with CDC's mainframe systems.

Under cross-examination, Morris trial witness Keith Bostic, a programmer/analyst at UC Berkeley's computer systems department, conceded that some of the 40 hours his team spent battling the worm were occupied fixing bugs in the worm program itself. "You were just having fun, right?" asked Morris' attorney. "Yes," Bostic replied. We'll be covering the trial to the end and beyond and want to hear your observations. Call hacker control at 800-343-6474 and ask for News Editor Pete Bartolik or E-mail us on MCI Mail, addressed to Computerworld.

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*Audit Bureau of Circulations Supplemental Data Report, May 25, 1987

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